ARCHAEOLOGY

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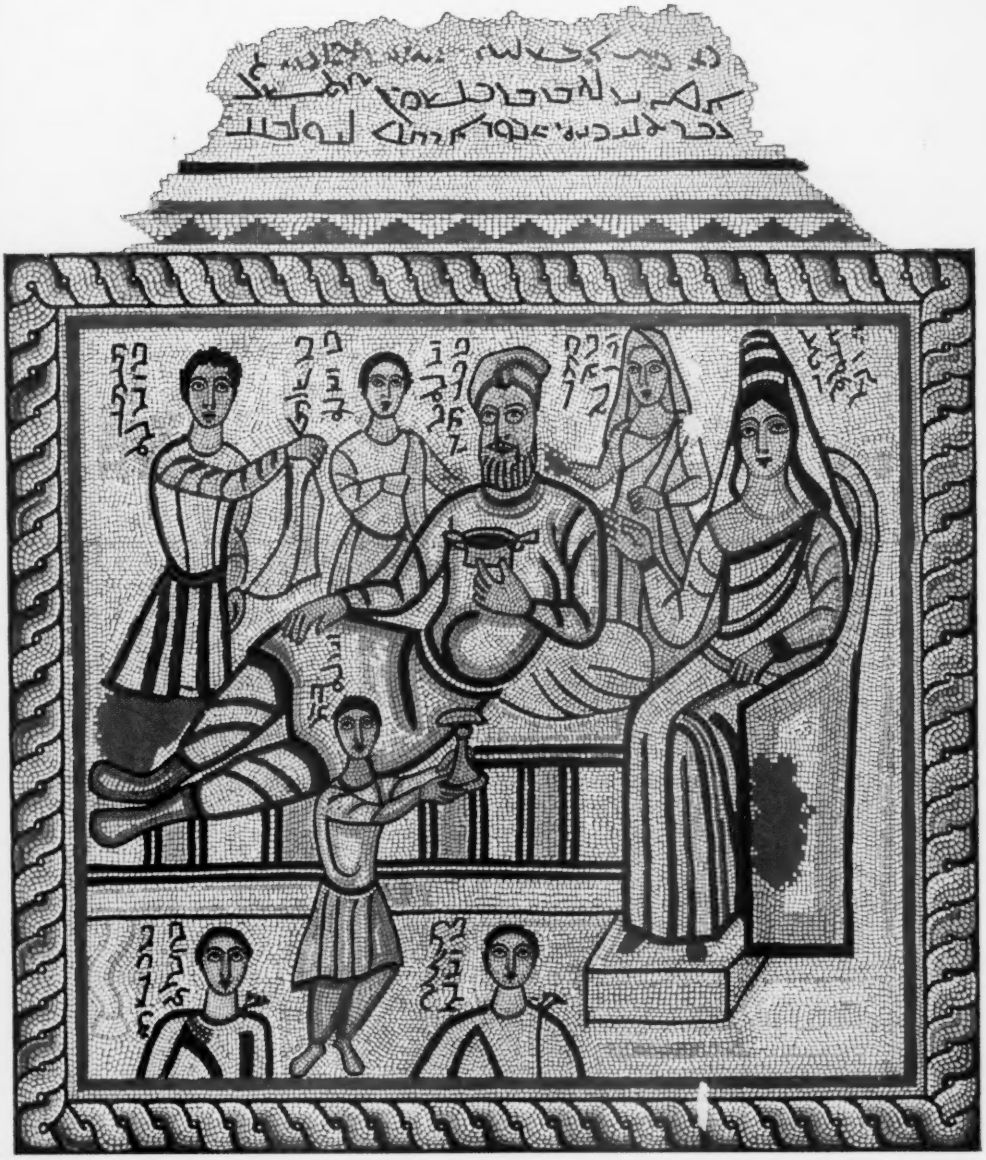

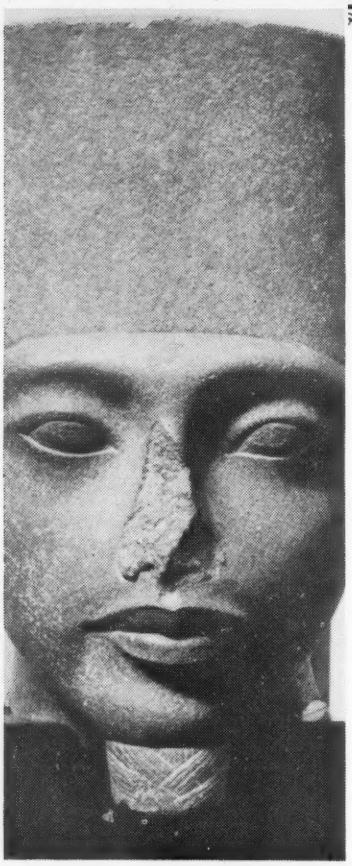

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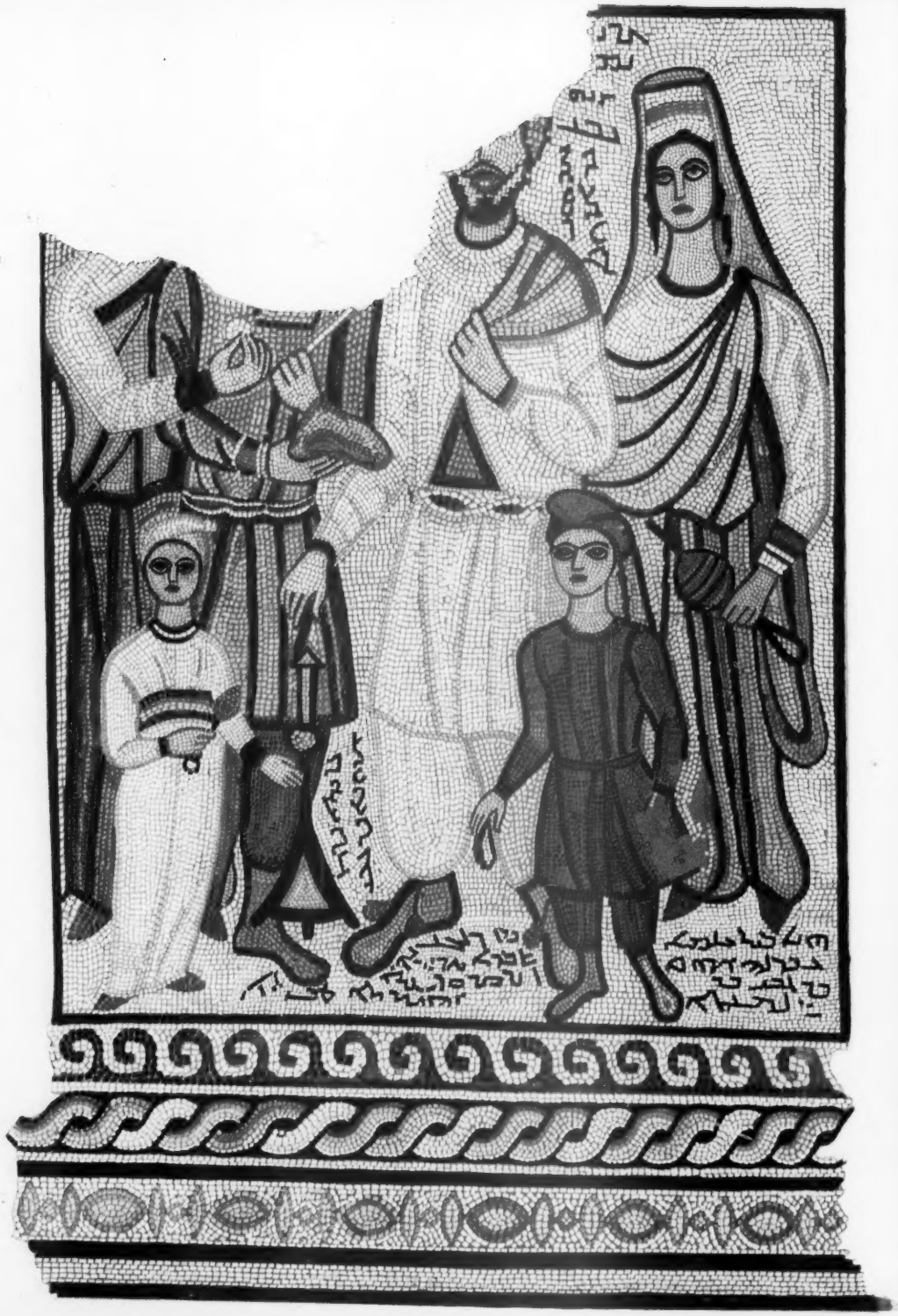


NEW MOSAICS FROM EDESSA

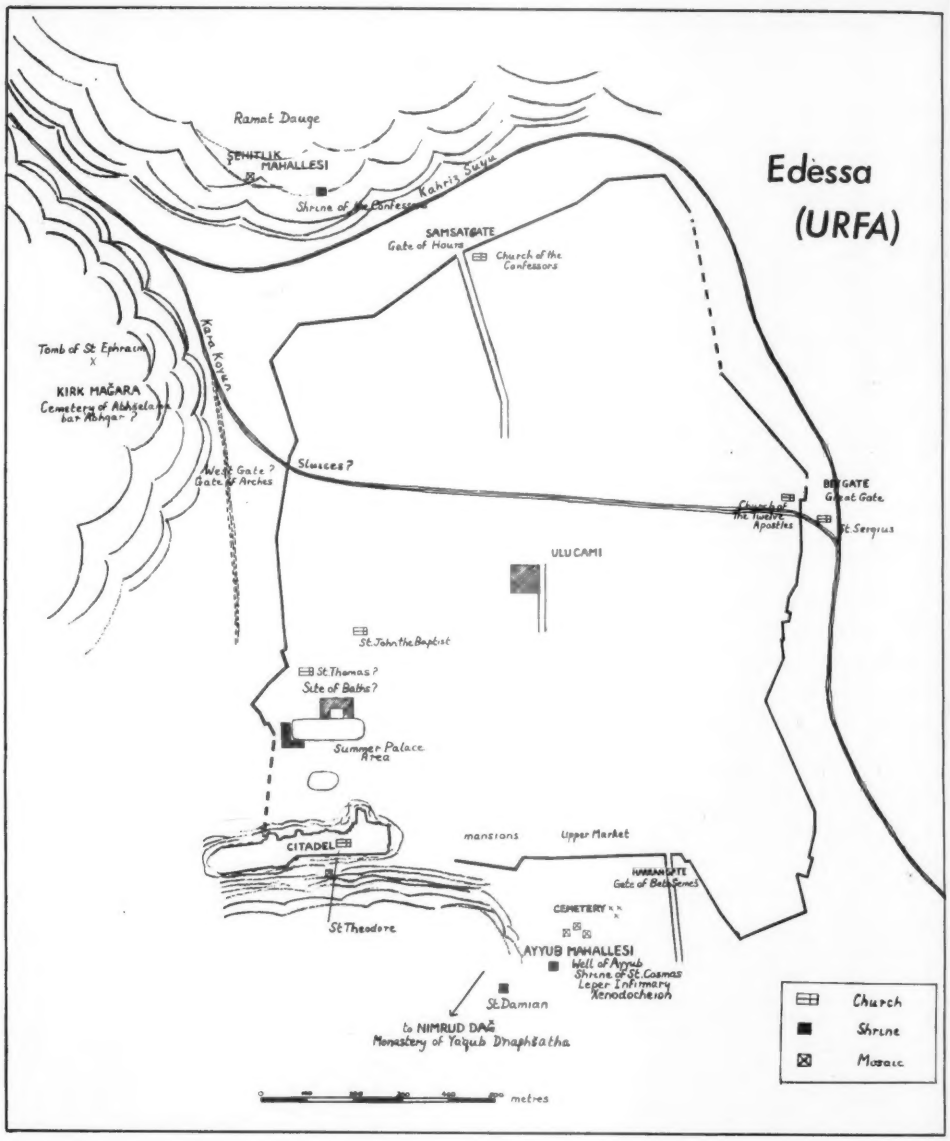
BY J. B. SEGAL

THE CITY OF URHAI, better known under its Seleucid name of Edessa, today the Turkish Urfa, stood at the junction of two ancient highways. One passed through Samosata and linked the massif of northeast Anatolia with the cities of Syria; the other was a celebrated trade route along which the silk and spices of China and India were carried to Asia Minor and the Mediterranean seaboard. The Seleucids appreciated the strategic and economic importance of this site, and here in 304 B.C. Seleucus Nicator founded, or refounded, a city under the name of Edessa. In the latter half of the second century B.C. an Arab dynasty established itself there, and for over three centuries maintained a precarious autonomy between the rival powers of Rome and Parthia. Typical of the resilient rulers of Edessa was that Abgar who guided Crassus and his legions—to suffer an ignominious defeat at Carrhae (Harran), twenty miles south of Edessa (53 B.C.).

Edessa's chief title to fame rests, however, on its claim to be the first independent kingdom of note to adopt Christianity as its official religion. According to legend, King Abgar the Black sent a letter to Jesus, inviting him to share his own small kingdom; Abgar's envoy brought back from Jerusalem a portrait of Jesus and a letter prophesying that Edessa would forever remain inviolate from enemy conquest. Recent study has shown the Abgar legend to be no more than a pious fraud, but in mediaeval Christendom it received wide credence. The precious "relics" were visited by countless Christian pilgrims from western Asia and even from Europe. Copies of the letter from Jesus to Abgar have been found inscribed on stone at widely separated sites—at Edessa itself, in Asia Minor, in Macedonia and in Egypt; Abgar letters, in more portable form, were popular as amulets in pre-Norman England.

It was not Abgar the Black but probably Abgar the Great, two centuries later, who made Christianity the official religion of Edessa. The city had already been the scene of literary and cultural activity; Syriac, the literary language which evolved from the local dialect of Aramaic and became the vehicle for most of the Christian writers in the region east of Antioch, was already well developed in pagan times. The first Syriac version of the Bible may well have been the work of the Jews of Edessa, and in the second century the gnostic Bardaisan and his son Harmonius composed polished verse and dialogue in Syriac. But Christianity gave fresh creative impulse to the city. Its academies drew students from all parts of Mesopotamia and Persia. The caves in the hills around the city were occupied by devout, and sometimes learned, anchorites. Churches, shrines and monasteries increased in wealth and number—in the late tenth century the Arab historian Ibn Hauqal relates that there were no fewer than three hundred in Edessa and its environs—and the cathedral was accounted one of the wonders of the world. Edessa fell to the Moslems in 639, but its Christian community continued their life with few restrictions. Indeed, from 1027 to 1144 its rulers were, with a brief intermission, Christian; for the last fifty years of that period they were the Latin Counts of Edessa. In 1146 the churches were sacked and the population enslaved by Moslem troops: this marked the end of the glories of the city of Abgar. When the news

Left: **The Tripod Mosaic.** The color transcription is by Mrs. Seton Lloyd, of the British Institute of Archaeology at Ankara, from rubbings and notes by J. B. Segal.



Plan of Edessa (Urfa) showing the citadel, the gates and the areas outside the walls where the mosaics were found in cemeteries. Drawn by Donald Strong, based on the plan by S. Guyer, *Petermanns geographische Mitteilungen* (1916) plate 27. Modern sites in capitals, ancient in upper and lower case.

NEW MOSAICS continued

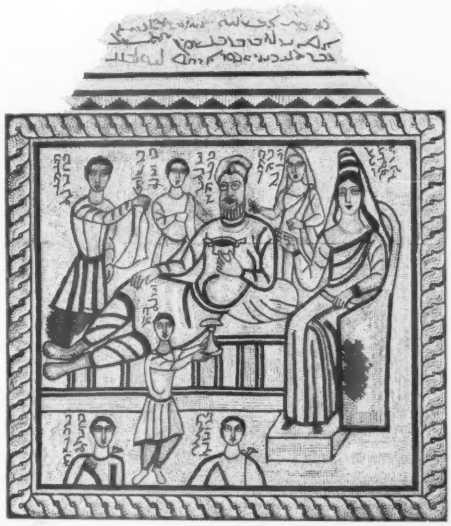
reached Western Europe, it caused deep emotion and precipitated the Second Crusade.

THE STORY OF EDESSA from the fourth to the thirteenth century is well documented by Syriac chronicles; less is known of the earlier period. We learn a little from the monuments remaining in present-day Urfa. On the precipitous Citadel mount, southwest of the city, among heaps of fallen masonry, stand two sixty-foot columns with Corinthian capitals. In the third and fourth centuries they were, it appears, crowned with gleaming statues of Abgar the Great and his queen; indeed, a Syriac inscription on one column still records the dedication to the queen. Below, due north of the Citadel mount, near the site of Abgar's palace, are two fish pools. In ancient times the carp of these pools, like the sacred fish of other Mesopotamian cities, were probably sacred to the goddess of fertility. The pilgrim abbess Aetheria of Aquitania describes them in her fourth-century Latin journal as "shining and succulent." Even today the people of Urfa do not kill the carp in these pools for food but treat them as pets; the fish will leap several inches out of the water to snatch at morsels of bread. A large portion of the city walls may still be traced, and they are in excellent condition from the Citadel mount eastward to the Bey (formerly the Great) Gate, which was the scene of bitter carnage during the First Crusade. The channel that today conducts the river Kara Koyun through the center of the town was the work of the Emperor Justinian: it was built to divert the troublesome stream (well described by its Syriac name of Daişan, "the leaper") from its natural bed on the west and southwest of the city (see plan on opposite page).

The decipherment of inscriptions at Edessa, notably in the village of Kirk Mağara west of the city, by Sachau, Pognon and other scholars has added to our knowledge of the city's history during the first centuries of the Christian era. Most of these memorial texts are in Syriac; a few are in Hebrew or Greek. From them we learn that paganism lingered in Edessa long after the introduction of Christianity there, and from them we also learn something of the topography of the town at that period. Yet our information remains meager, and additional sources of data are welcomed by students of the history of Mesopotamia.

In 1952 I was enabled to shed some fresh light on early Edessa by the discovery of the "Family Portrait" Mosaic in a tomb in a wadi due south of the Citadel mount. In the summer of 1956 I conducted a second season at Urfa. The Syriac inscriptions and two pieces of sculpture found then are discussed in an article in the *Bulletin of the School of Oriental and African Studies* XXII (1959) 23-40. Here I offer for the first time an account of four new mosaics found on the outskirts of Edessa during that campaign.

THE FIRST MOSAIC—which I call the Tripod Mosaic—was found in the area north of the city, Şehitlik Mahallesi, the district of the Martyrs' Grave. This name recalls an event in the early history of Edessa. Outside the North Gate (formerly the Gate of Hours, or of the Sundial) stood Ramath Dauqe, the Hill of Watchmen. Here in the fourth century was a cemetery where malefactors and the poor were buried. The three Christian martyrs of Edessa were interred in this cemetery, probably in 309-

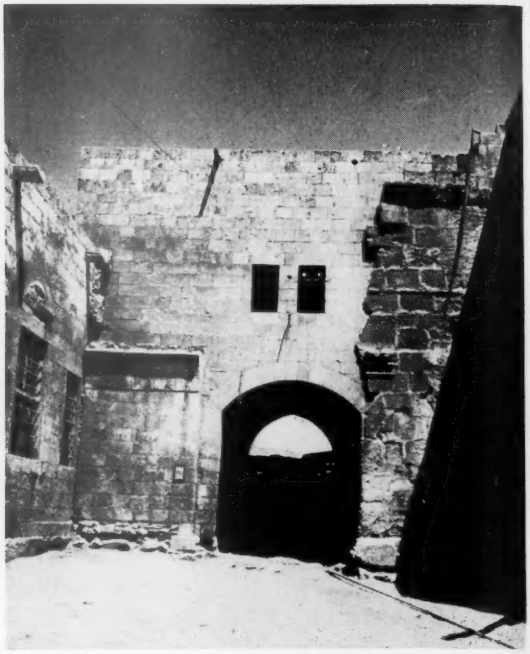


The Funerary Couch Mosaic. The color transcription on the cover is by Mrs. Seton Lloyd, of the British Institute of Archaeology at Ankara, from rubbings and notes by J. B. Segal.

THE AUTHOR is Reader in Aramaic and Syriac in the University of London, and is on the staff of the School of Oriental and African Studies, London. He holds the degrees of M.A., Cambridge, and D.Phil., Oxford. He was at one time in the Sudan Government and has traveled widely in the Middle East. This past summer he has been carrying out a new campaign at Edessa (Urfa).

The 1956 campaign was made possible by the generous assistance of the Pilgrim Trust administered by the British Academy and of the Central Research Fund of the University of London. The courtesy and help of the Turkish Department of Antiquities and of the British Institute of Archaeology at Ankara greatly facilitated our work in the field. Special thanks are due to Dr. D. S. Rice, Reader in Islamic Art and Archaeology in the University of London, who participated in this expedition, and to his assistants, Dr. Donald Strong of the British Museum and Mr. Michael Ballance of the British School at Rome.

The color plates were made possible by a grant from the Central Research Fund of the University of London.



Left: The entrance to a cave in the hills outside Urfa, or Edessa. *Right:* The Harran Gate, through which, legend tells us, the portrait of Jesus was brought to Edessa. Remains of the Byzantine city wall are seen at the right.

NEW MOSAICS continued

310, and thirty years later a shrine was erected to honor their remains. It is from the shrine that the district received its name—which it still bears, over sixteen centuries later. Nearby was the reputed resting-place of St. Ephraim, buried among the needy whom he had tended.

Some of the tombs of this cemetery still survive, each an underground rock-cut chamber with conventional *arcosolia,* or arched recesses, used as the actual burial places. We found one tomb with its door of dressed stone still swinging smoothly on its hinges; in another, simple stone busts are carved in relief in the roof of the *arcosolia* and above the doorway, inside the chamber. Two floor mosaics had already been discovered among these tombs. One was recorded in a rough sketch by Julius Euting in 1890; six weeks later it had been destroyed by unknown hands. The second was removed to the Istanbul Museum in 1901 and is on display there. Each portrays no more than a group of busts, and neither has the vivid interest of the Tripod Mosaic.

The central figure of the Tripod Mosaic, as we learn from the Syriac inscription, is named Adona. To his left stands his mother, to his right, a male and a female figure—the upper parts are missing—and below are his son and daughter. Adona carries a cloak and wears tasseled boots. His costume, like that of the other figures, is of Parthian style but not ornate. This is probably a family of modest means. The object upon a tripod is presumably a censer. Adona's mother and daughter carry what may be mirrors; in the hand of the male figure to his right is an object resembling a cap. He himself (like Maqimu, the central personage of the Family Portrait Mosaic) holds a leaf(?) in his right hand, while the woman at the extreme left holds what may be a flower. Flowers may have been cultic symbols among the pagans of Harran, south of Edessa (center of the cult of the moon god Sin), and the persons portrayed in this mosaic were certainly pagan, since the legend contains no Christian formula. The inscription at bottom right of the mosaic reads:

This is the tomb made by Adona son of GBY son of ŠLM'T'

and the inscription at bottom center, which is more obscure, may read:

He who prayed for(?) a child, oh Haritha,
. . . tears(?) . . . a goodly latter end(?)

The Tripod Mosaic does not bear a date; but there is

One of the two fish pools near the site of the palace of King Abgar. In the background is the mosque of Ibrahim, which stands on the site of a church.

some similarity in the treatment of the tesserae, the grading of colors and the poses of the figures between this mosaic and the Family Portrait Mosaic, which is also undated but ascribed to the second or third century.

THE THREE OTHER MOSAICS—the Phoenix Mosaic, the Orpheus Mosaic and the Funerary Couch Mosaic—were all found in the district of Ayyub Mahallesi, south of the city walls (see plan). Here too the modern name—the district of Job—recalls an event in the early history of Edessa. Legend relates that the emissary of King Abgar passed this way on his return from Jerusalem, bearing a portrait of Jesus as well as the letter. Before entering the city, he approached the well of Job, which lay south of the Harran Gate. Somehow the *mandelion* (cloth or napkin) with the portrait of Jesus fell into the well, and thereafter its waters were endowed with powers of healing. In the fifth century a leper house and an infirmary were erected nearby, and two shrines were dedicated to the martyr physicians Cosmas and Damian. Zengi, the Seljuk conqueror of Edessa, during his visit to the city in 1145, bathed in the waters of this well in order to relieve his gout.

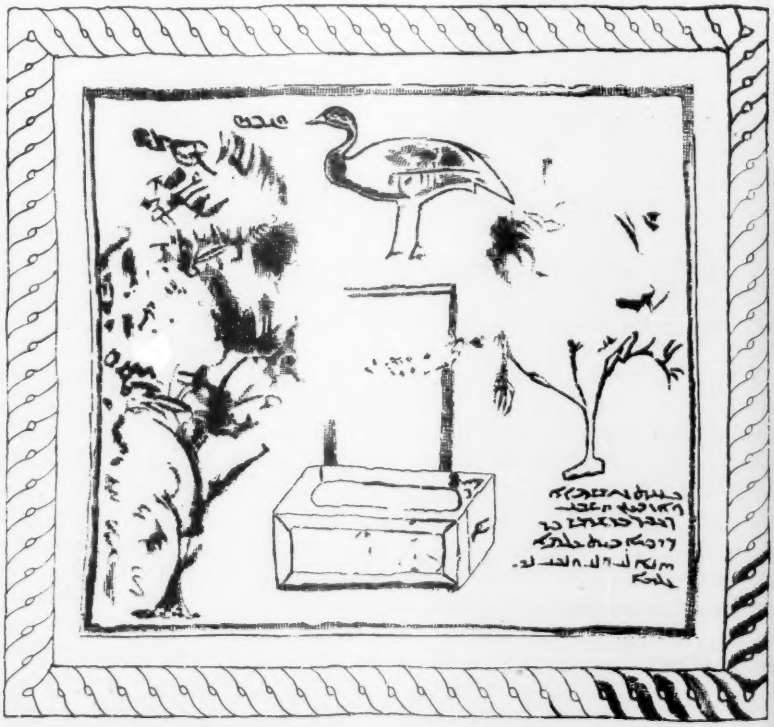
In this area was another cemetery where the tombs were both Christian and pagan. The Syriac inscription on one pagan tomb bears a date corresponding to A.D. 208-209 and is therefore the oldest dated inscription found so far at Edessa. The Phoenix Mosaic was found in a cave tomb, where it occupied almost the whole surface of the floor. The phoenix—its name is written in Syriac—is shown between two trees, one with a bird or birds in its branches. It stands over a wreathed sacred pillar, a familiar object on contemporary coins and inscriptions of Edessa, and below is a sarcophagus very like the *arcosolia* of the Edessa tombs. We have, then, a coherent whole—a grave is surmounted by the pillar representing the habitation of the soul or the soul itself, and above is the phoenix, the symbol of rebirth. The inscription reads:

> In the year five hundred and forty-seven made by Bar Šemeš son of BRQ' (is) this tomb for myself and for myself and for my children as a tomb.

The style of both the mosaicist and the writer is not of a high order. The date (given in the years of the Seleucid era) corresponds to A.D. 235-236.

View of the Citadel mount of Edessa, showing a section of the city walls and the two high columns.

NEW MOSAICS continued



The Phoenix Mosaic, from rubbings taken by J. B. Segal.

A few hundred yards from the Phoenix Mosaic is another floor mosaic, in another cave. It portrays Orpheus —again the name is written in Syriac—seated upon a conventional mound; around him are animals—a goat, a lion and birds—in attitudes of docility. The inscription, held by two *putti,* reads:

> In the month Tammuz in the year thirty-nine, I Aphtuha son of BRLY made for myself this tomb, for myself and for my children and for my heirs to eternity.

The figure 500 should be supplied in the date, which corresponds to A.D. 227-228. We should not be surprised at encountering Orpheus in Edessa, for throughout its early history its citizens loved dancing, song and poetry. Moreover, in the first decades of the third century the Orpheus theme had acquired some popularity in Rome's eastern provinces. A variation of the motif is found in the contemporary decoration of the synagogue at Dura Europos. And we are told that in the private chapel of Alexander Severus—who became emperor in 222, five years before this mosaic was constructed at Edessa—stood the busts of Abraham, Jesus, Apollonius of Tyana and Orpheus.

Very close to the cave of the Orpheus Mosaic is that of the Funerary Couch Mosaic. Here the central figure reclines on a couch in a pose familiar at Palmyra and elsewhere. In his left hand he holds a cup of wine. To his left sits his wife, wearing elegant robes, a gold necklace and a high headdress, her feet resting on a footstool. A daughter, simply dressed, stands behind; on the other side are two sons, one carrying a napkin. Below, another daughter holds what may be a spice box, and at the bottom of the mosaic are the busts of two more sons. The dedicatory inscription is in two parts. One, in black tesserae, reads:

> I ZYDLT son of Barbe'ešmin made for myself this burial place, for myself and for my children.

The other, in brown tesserae, is written alongside:

> In the month Ab in the year five hundred and eighty(?) and nine

This mosaic was made, then, in A.D. 277-278. The liveliness of its treatment compensates for the comparative coarseness of the tesserae.

THESE FOUR MOSAICS are a valuable addition to those previously found at Edessa. They illustrate in some measure the cultural and religious background of the city in the third century. And they provide an encouraging augury for our 1959 season at this site.

The Orpheus Mosaic: view taken from the entrance to the cave.

BY ROBERT M. COOK AND JOHN C. BELSHÉ

DATING BY ARCHAEOMAGNETISM

THE REMANENT MAGNETISM of many archaeological remains offers a method of dating that is in some ways more exact than radiocarbon, and perhaps basic to it. Particles of magnetic oxides of iron, which occur in appreciable quantity in most clays and in many rocks, have a convenient property: when they are heated above about 600°C (their so-called Curie point) they lose their magnetism, and when they cool back through that temperature they become remagnetized. The new magnetization, in both direction and intensity, is determined by the magnetic field in which cooling takes place, and this field is normally the magnetic field of the earth. Since the magnetization of the earth's field is changing continually, while the magnetization of these fired clays and rocks normally remains fixed (until they are heated again to their Curie point), they preserve a record of the direction and intensity of the earth's field at the time when they were fired. So by using dated archaeological remains it is practicable to ascertain the changes in the earth's magnetic field which took place before observations of direction began in the sixteenth century. When these changes have been ascertained, suitable archaeological remains can be dated, in turn, by their remanent magnetism. In periods for which there are no fixed archaeological dates, remanent magnetism still allows some sort of relative chronology.

The accuracy of this archaeomagnetic dating is closer than might be expected. The intensity of the magnetism of the earth's field has decreased by more than five per cent since 1830, when observation began, and by fifty per cent since the second century, according to the results of examination of Roman bricks. We have not yet been able to make a serious study of intensity; it is the changes in direction on which we have concentrated. At present the mean variation of the compass in Britain is about ten minutes a year, or a degree about every six years. Allowing for faults in measurement, the daily variations in the earth's field and anomalies in our samples, we think that the reasonable limit of archaeomagnetic accuracy is about two degrees or—to be on the

OUR TWO AUTHORS have come to collaboration on this interesting new method of dating from widely different backgrounds. Robert M. Cook is an archaeologist, now Reader in Classical Archaeology at Cambridge University. He received the B.A. degree there in 1931, studied at the British School of Archaeology in Athens (1932-34) and taught at the University of Manchester. He has participated in excavations at Perachora (1933), Antissa, Lesbos (1934) and Zante (1934). Author of numerous articles, his latest production is *Greek Painted Pottery,* a book which is soon to appear (Methuen).

John C. Belshé is a geophysicist. He studied at the University of Notre Dame, Iowa State University (B.S. 1949) and the University of Wisconsin (M.A. 1953). Going to Cambridge University as a Fulbright Scholar in 1953, he remained there and is now Senior Assistant in Research in the Department of Geodesy and Geophysics. His main field of research is the earth's magnetism.

1. Preparing samples to be removed from a kiln of the seventh century A.D., in the area of the American excavations at the Athenian Agora.

safe side—twenty-five years. This accuracy does not decrease with remoteness in time; in converting an archaeomagnetic reading into an absolute date, the base from which calculation is made is not the present day but the nearest fixed point on the ascertained curve of the directional change of the earth's magnetic field for the region concerned. It is necessary to stress the regional character of the earth's field, since it appears that at any one place the long-term variation in direction is governed by regional disturbances of the order of about one thousand miles in diameter. To construct regional curves of direction is, of course, a slow and often difficult task, more valuable at first for the geophysicist than for the archaeologist.

The principle that remanent magnetism can be acquired in fired clays has been known for about a hundred years, and several students have tried to apply it to the dating of ancient pottery. But pots are movable, and unglazed pots may not even have stood upright in the kiln. So although most pots have a strong remanent magnetization, its direction cannot be related to any fixed point and for that reason has no significance. But fixed structures—hearths, walls and floors of burnt buildings, and kilns—are often in their original position, so that their remanent magnetism can be determined in relation to true north or any other fixed point. This application was first realized by Professor E. Thellier of Paris. Our work, which was begun in ignorance of Thellier's, has owed much to his generous advice and example. But we have been more fortunate than he in the number of structures from which, by the kindness of local archaeologists in Britain, we have been able to take samples.

THE MEASURING OF THE DIRECTION of remanent magnetism must—at least with our present equipment—be done in a laboratory. The first task, then, is to select and remove samples from the structure in such a way that their original orientation is recorded precisely. For measurement in the laboratory we have found it most satisfactory to use samples about four inches cube, and, as a precaution against accidents and anomalies, we like to have six or more samples from any one structure. Different materials and conditions require different methods for taking samples. Our favorite, which we learned from Thellier, is illustrated in Figures 1-4. First, suitable parts of the structure are chosen, where we are certain that there has been no shifting from the original position. Then bosses of the required size are isolated by chipping or cutting round them. Next, a mold (composed of four brass or duraluminum plates 4½ inches long by 2½ inches deep) is fitted about each boss and propped and adjusted until the top is horizontal, as judged by a spirit level (Figure 2). After that, quick-setting plaster is

poured in and smoothed off flush with the top of the mold. When the plaster has set, we have the sample enclosed on the top and the four sides in a solid rectangular block, the upper surface of which is horizontal; so the sample can now always be set up again at its original level. For marking the sample's direction in relation to true north, the most satisfactory instrument is a theodolite, set some distance away from the sample. One operator sights from the theodolite, and another sights back from an alidade laid on the plaster top of the sample (Figure 3). When both instruments are aligned, a line is scored in the plaster along the edge of the alidade and the bearing is recorded; the bearing is related either to the position of the sun or to points fixed on a reliable map. Finally, the sample is detached from the structure by undercutting and removed to the laboratory (Figure 4).

For the measuring of samples Thellier uses a rotating-

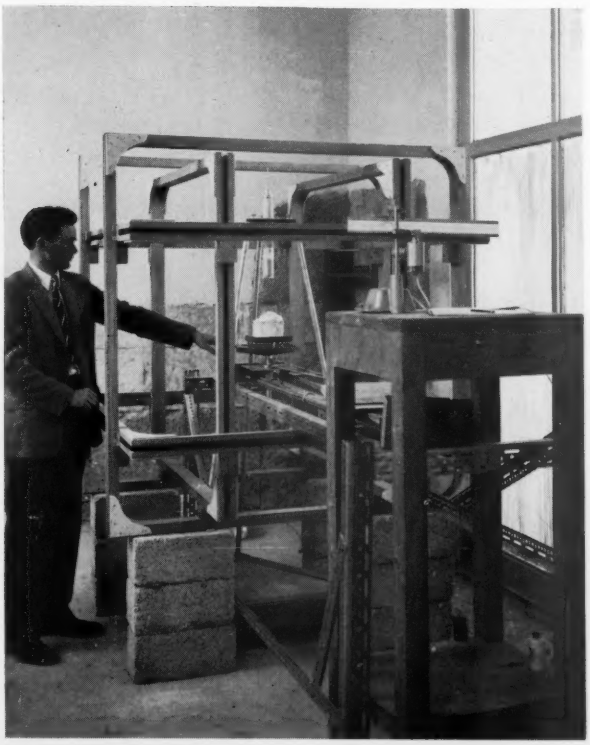
2. Two samples have been cut round and enclosed in molds, which have been leveled. The next stage is to pour in plaster. The location is an early Greek oven or kiln at Delphi.

3. The same two samples shown in Figure 2, but seen from the left. The molds have been filled with plaster, and the bearing of the farther sample is being taken by sighting through the alidade onto the theodolite.

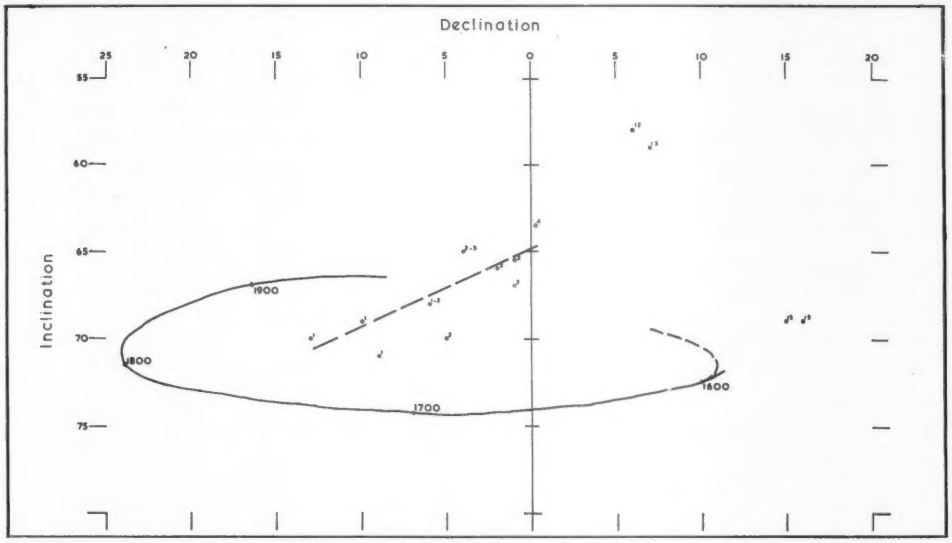
4. *Left:* The sample detached and removed from the mold. The upper arrow is the bearing along the alidade; the lower, parallel lines show magnetic north.

sample magnetometer. We prefer an astatic magnetometer, built specially to suit our needs (Figure 5). The principle of this magnetometer is elegantly simple. In the center is suspended the magnet system, consisting of two small magnets of equal intensity, set one a little distance above the other but in diametrically opposite directions. As a result, the effect of the earth's field on one magnet is canceled by its opposite effect on the other, and the combined system is able to swing freely. Below the magnet system is a level table on which the sample is set. Since the force of a magnetic field decreases with the cube of the distance from the magnet, the magnetism of the sample acts more strongly on the lower and nearer than on the upper and farther magnet, and so the magnet system is deflected by the magnetism of the sample. To measure the declination (or horizontal bearing) the sample is set lying on its top; for inclination (or dip) it is set in turn on each of its four sides, and a mean value calculated from the different readings. Since the original orientation of the sample is known, these values can be related to them. The results may then be plotted according to whatever system or projection is fancied.

FROM 1953 TO 1957 we took samples from about fifty structures, mostly Roman-British kilns. Some of these structures were in bad condition, disturbed or doubtfully fired; from some we could take only one or two samples; and in our earlier work we suffered from inexperience. But there were fourteen structures where we felt sure that the condition was good, our sampling satisfactory, and the archaeological date fairly precise. Their results were remarkably consistent. The curve for the Roman-British period, from the first to the fourth century, is generally clear, and there are two suggestive pairs of late mediaeval readings. What lies between we cannot guess, but considering the interval in time we do not expect a simple continuation of the Roman-British curve. These results agree with Thellier's few readings from across the English Channel. The standard diagram in the text-books was, of course, based on direct observations, which in London go back only to the 1570's and in Rome to 1540. By adjusting the Roman reading to compensate for its different latitude and longitude, a curve was constructed, as shown in the lower part of Figure 6, which suggested that for London the direction of the earth's magnetic field varied in a regular cycle of about six



5. The magnetometer set up in the Museum of the Athenian Agora. The tube in the center contains the magnet system; below is the rotating table with a sample on it. The outer frame supports Helmholz coils, to neutralize the magnetic field of the earth. From the stand on the right a beam of light is projected onto a mirror attached to the magnet system, and this beam is reflected onto the graduated scale at the top of the stand, thus measuring any rotation of the magnet system which is caused by the magnetic force of the sample being measured. Photograph by Alison Frantz.



6. Changes in the direction of the earth's magnetic field for London. The continuous line is based on recorded observations; the line of short dashes gives Bauer's extrapolation from an observation at Rome; and the line of long dashes shows the results from fourteen archaeomagnetic samples (marked by rings).

ARCHAEOMAGNETISM CONTINUED

hundred years. That does not seem likely now. It seems instead that the curve of variation for any region and period cannot be predicted, but must be determined empirically by measuring samples which can be dated by other means. There is plenty of work to do. How quickly it is done depends partly on the willingness of excavators of dated sites to let samples be taken from their fired structures. This spring we have been collecting and measuring samples in Greece. Not only is a longer series of archaeologically dated structures available there than in Britain, but the distance between the two countries is such that useful information may be obtained for locating regional disturbances in the past.

Archaeologists may find archaeomagnetism useful for other purposes besides dating. For example, where there is doubt whether a burnt layer or piece of wall is in its original position, the direction of its remanent magnetism might well be decisive. The range of magnetic variation for Britain seems to be no more than 40° in declination and 20° in inclination. If, then, the direction of the remanent magnetism of the subject falls outside this range, it is probable that that subject is not in the same position as when it was heated and cooled.

Again, buried walls and floors or the filling of pits and trenches may produce anomalies that can be detected by a portable magnetometer. The idea was proposed by Belshé three years ago, but since we had not the funds, Dr. M. R. Aitken of Oxford was kind enough to undertake its development, and during the last year he has been able to publish several accounts of his success in archaeological prospecting by this method.

More work must be done on the intensity of remanent magnetism. This, too, varies and so should provide evidence for dating, though with less precision than does direction. Even so, for historical periods, it is probably no cruder than radiocarbon. One merit of measurement of intensity is that the orientation of the sample is unimportant, and so pottery can be used as well as pieces from structures.

A FULLER ACCOUNT of our work, as well as references to the work of other students, appeared in *Antiquity* for September 1958. We shall be glad to try to answer readers' questions or to advise on the taking of samples. What is needed should be clear, but we emphasize that present orientation must be clearly and durably marked.

A SAMOTHRACIAN NECROPOLIS

BY ELSBETH B. DUSENBERY

SAMOTHRACE IS BEST KNOWN throughout the world today as the Greek island from which came the famous Winged Victory now in the Louvre in Paris. It has also been of special interest to students of the Greek and Roman world as the site of the Mysteries of the Great Gods, one of the most important of the international religious cults of antiquity. During the last two decades the unique cult buildings of the mystery sanctuary have been brought to light through extensive excavations, and the archaeological activity on the island has led to several small excavations on the periphery of the sanctuary, including one in an unusually interesting ancient cemetery.

The South Necropolis, as the cemetery is now called, was an unprepossessing knoll before digging began. Its unexpected treasures lay under a blanket of coarse grasses and thorn bushes on the steep western bank of a deep ravine which runs toward the sea between the ancient city of Palaeopolis and the Sanctuary of the Great Gods. West of it, just over a low ridge, are the orderly ruins of that sacred place. Downstream about thirty yards, the ravine is partly bridged by the great vault of the Ptolemaion, built in the third century B.C. to carry the road from the city to the sanctuary. During the summer the ravine is a dry gulch but in the spring it carries torrents of water to the sea from the snows of the huge mountain which dominates the island. The city itself, still bordered by its colossal wall, lies to the east on a precipitous, rocky shoulder of this mountain. Where there were once streets and temples and houses there is now only a romantic wilderness of rocks and wild olive trees. Except for the wall it would be hard to imagine that a large town once stood here—large enough to require, over the centuries, acres of land for its cemeteries. Today they too lie largely unmarked under infertile meadows. Some notion of their extent has been gained through the discovery of scattered tombs, often found during road repairs in the vicinity of the modern hamlet of Palaeopolis, and portions of two cemetery areas which have now been systematically excavated. The first is near the sea-

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The author has an A.B. from Smith College and did graduate work at the Institute of Fine Arts of New York University. Mrs. Dusenbery participated for three seasons in the New York University excavation of the Sanctuary of the Great Gods in Samothrace under the direction of Professor Karl Lehmann. Formerly Curator of the Eugene Schaefer Collection of the Newark Museum, she is presently a Research Associate of the Institute of Fine Arts.
The excavation in the South Necropolis, near Palaeopolis in Samothrace, which is described in this article, was carried out in 1957 by the Royal Greek Ministry of Education, represented by Mr. Andreas Vavritsas, Ephor of the Islands, and the Archaeological Research Fund of New York University, represented by Mrs. Dusenbery. Miss Elaine P. Loeffler, Fellow of the American Academy in Rome, and, for a time, Miss Iris C. Love, a student at the Institute of Fine Arts, also participated in the campaign.

1. A cremation burial of the early fifth century B.C., in the South Necropolis at Samothrace. The vessel containing the ashes was set into the wine amphora through its broken side. Next to the large jar was placed a black-figure *olpe* (jug). The burial pit was roughly lined with large stones.

NECROPOLIS continued

2. *Left:* A black-figure *pelike,* ca. 510 B.C., by the Eucharides Painter, used as a container for the ashes of a cremation burial in the South Necropolis. The painted panel shows Hermes in the unusual role of flautist making music for a large and rather ribald goat which dances before him. Behind the god stands a satyr holding a wine skin. Height 13 inches.

3. *Right:* A red-figure amphora, ca. 470 B.C., by an unidentified painter, served as the receptacle for ashes in the burial illustrated in Figure 1, where its mouth and one handle are visible. Height 13½ inches.

shore, on the site of the guest house built by the Greek Government to accommodate tourists. This cemetery, whose existence had not been suspected, was disclosed in 1954, when foundations for the new building were started. It yielded more than fifty tombs of great interest and variety. The second cemetery, the South Necropolis, was uncovered that same year by spring freshets in the ravine, and excavated in 1957 to prevent the tombs from being washed from the bluff.

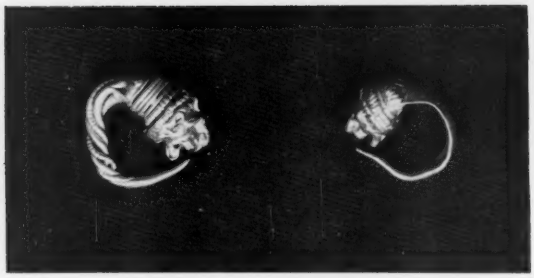
THE UNINHABITED BANK of the wild ravine was first chosen for a burial site in the Greek Archaic period, probably about the middle of the sixth century B.C., and it continued in use for at least seven hundred years. During the first two centuries of its existence, cremation seems to have been the exclusive burial rite. Excavation revealed layers of ash and carbonized material spreading over many square yards, in some places more than three feet thick. Great pyres fueled with wood had been burned along the river bank, and when the bodies were consumed the ashes had been gathered up and placed in jars. Ash-laden vessels were found buried in pits in the virgin earth all around the edges of the black area (Figure 1). The vases themselves had often been subjected to fire, as their flame-damaged surfaces show. They were almost exclusively amphoras and other wine jars, both plain and decorated. Many of the coarse vases may have been made in Samothrace; the decorated ones were largely imports from Athens. Both Archaic black-figure and fifth century red-figure vases are represented. A black-figure *pelike* (a two-handled jar) by the Eucharides Painter is one of the most important of these vases (Figure 2). One of the most pleasing of the red-figure vases, despite its damaged surface, is the amphora containing the ashes of a cremation burial which is shown in Figure 1 inside a large amphora (Figure 3).

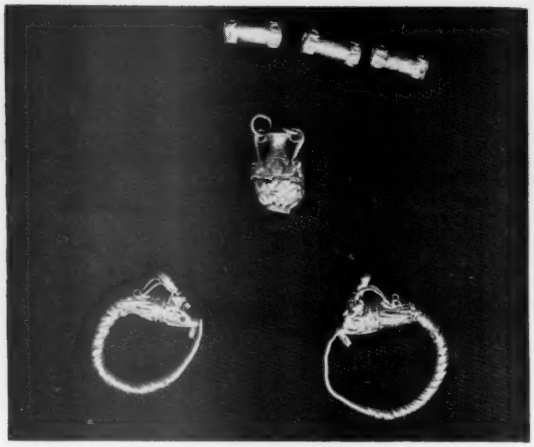
Besides the burial vessels, few other offerings seem to have been subjected to the funeral fires. In some cases a small drinking cup was evidently placed on the pyre and later used as a cap for the burial vessel. In a few instances a large drinking bowl or a jug of the sort often used for ladling and pouring wine was burned and then either broken and put into the vessel with the ashes or laid alongside it. Except for these the only surviving gifts are occasional pieces of jewelry—earrings, finger rings and pins (fibulae), all severely burned. Perhaps the cups and dippers were used during the funeral rites for toasts or libations to the deceased. In any case, it seems likely that in the early centuries of the necropolis the dead were dressed for the pyres in stately fashion and sent into the next world with only the clothing they wore, a wine jar and a cup.

Funeral pyres burned on the river bank for more than two hundred years. In the relatively small area which has been excavated (about seven hundred square feet) more than seventy intact cremation burials have been discovered. Then, near the end of the fourth century B.C., came a sudden and dramatic change in funeral customs. It coincided with the beginning of a period of spectacular building activity in the Sanctuary of the Great Gods under the patronage of Macedonian princes and the successors of Alexander the Great. While the first of the new buildings was rising in the sanctuary, cremation was abruptly and apparently completely replaced by inhumation. When the material from the cemetery has been entirely restored and studied, some overlapping of the two rites may be noted, but the present evidence is that the use of cremation simply stopped in the late fourth century and was immediately replaced by inhumation. The unburned bodies were now placed in enclosed graves and were often provided with splendid tomb furnishings. Right in the midst of the area used so long for pyres we find the earliest and the richest of the inhumation tombs.

To put the cemetery in order for the new tombs, the deep layer of ash and soot was covered with a thick blanket of earth brought from some inhabited place—heavy with sherds of discarded pottery and other small objects. The river bank, originally a steep slope, had now been built up into a high bluff which invited the erosion which eventually (and fortunately) forced us to excavate it. The inhumation tombs were dug into the new ground; some of the largest extended down into or even below the burned area. Among these were rectangular tombs constructed of stone slabs, in which the bodies were laid on their backs (see Figure 10) and huge storage jars *(pithoi)* set into the earth on their sides. In the latter the dead were laid in contracted position. Slab tombs seem here to be characteristic chiefly of the late fourth and early third centuries, and those holding later burials were apparently re-used. The great *pithoi* were mostly contemporary with the slab tombs, although a few later ones were found. In the third century, graves constructed of large ceramic tiles came into use, and from then on these were the most common type of grave.

Men, women and children were all buried in similar tombs, and several multiple burials, of two or three per-





4. *Above:* An unmatched pair of gold earrings of the late fourth century B.C., from an inhumation burial in the South Necropolis. Diameter of the larger ¾ inch.

5. *Right:* A third century B.C. set of gold jewelry from an inhumation burial in a tile tomb of the South Necropolis. Height of the amphora pendant ¾ inch.

NECROPOLIS continued

sons, were found. From the finds it seems clear that these plural burials were made at one time. One tomb contained the skeleton of a young woman along with that of an infant, about a year old, lying on her breast.

Unfortunately, soil conditions have been unfavorable to the preservation of bones, and we do not know as much about the ancient Samothracians as we would wish. In most of the graves only a few fragments of bone were found, and often the remains had completely disappeared. Occasionally there was a reflection of the dissolved bones in faint, creamy lines in the earth; from these and from a few relatively well preserved skeletons we were able to form some impression of the people. The average height of both men and women seems, on the basis of our scanty evidence, to have been just over five feet. Only one person of those we were able to measure towered above the average. This was a woman about 5 feet 10 inches tall. In modern Samothrace, this would be extremely tall for either sex, and in ancient Samothrace the lady must have been spectacular. We were not able to note any striking evidence of disease or injury among the surviving remains except for an almost universal incidence of severe dental decay. The teeth of young and old alike generally had smoothly worn and polished chewing surfaces, suggesting some abrasive in the common diet such as would naturally be found in stone-ground grain.

In many cases the teeth, which seem so quick to decay during life and yet outlast the bones after death, were the only human remains found in a grave. They permitted us at least to determine how the body was originally oriented. Analysis of the positions of the graves and the directions in which the bodies lay shows that no regular custom was followed in this cemetery. In every period graves run in all directions, and orientation seems to have had little significance.

The late fourth and early third centuries provided the best finds. The earliest inhumation grave found so far is the slab tomb of a young girl in her mid-teens. Buried with her were a black-glazed drinking cup, a bronze mirror, a gold finger ring and a single gold hoop earring terminating in a lion's head of exquisite workmanship. A little later in date is another tomb of the same kind containing a mass of pottery, a Macedonian silver coin and a pair of unmatched gold hoop earrings with lion's heads like that from the first tomb (Figure 4). A small slab tomb contained a set of gold jewelry made for a tiny girl, including a ring, earrings, necklace and diadem.

6. *Left:* Terracotta statuette of a flying god, probably of the early third century B.C., from an inhumation burial in a huge *pithos* in the South Necropolis. Preserved height 6½ inches.

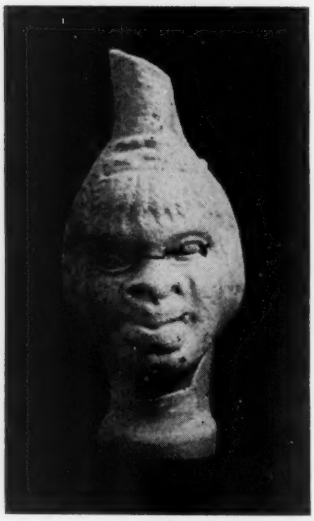
7. *Below:* Terracotta figurine, probably early third century B.C., with the Cypriote Eros and a child probably to be identified as Adonis, from the burial in the *pithos*. Height 4⅛ inches.

From a large tile tomb of the third century came an elaborate set of gold jewels—hoop earrings with heads of wild goats, cylindrical beads and a miniature amphora from a necklace, all decorated with delicate wire and granulation and set with paste garnets (Figure 5). In the same tomb there were also a gold finger ring, a funerary crown of veined gold leaves and a gold foil impression of a Samothracian coin—perhaps the central ornament of the crown.

The most impressive tomb of this flourishing era, however, contained no jewelry beyond a simple gold ring and a funeral crown made of gold foil. What made it extraordinary were some terracotta figurines of notable quality. These offerings, as well as traces of two skeletons, lay in a huge *pithos* nearly six feet high, which rested on its side deep in the earth. Unfortunately all the fragile figurines were shattered by the weight of the earth with which the *pithos* had been filled before its mouth was sealed with a sheet of lead and a thin stone slab. From the many fragments (the restoration of which is not yet complete) has emerged what we regard as one of the most beautiful objects to come from the necropolis: the delicately modeled figure of a youthful flying god (Figure 6). Fragments of two more of these figures were

found in the tomb. Another statuette, quite different in its vigorous style, is that of a satyr carrying a maenad on his back. Other figurines include grotesque characters and several groups in relief. One of these (Figure 7) seems at first glance to be simply a charming little group of *putto* and baby. Three replicas of this piece came from the tomb, and on the back of one, incised before firing, was an unexpected inscription referring to the Cypriote Eros. Such an inscription suggests that these figures may have had specific identities. Most amusing and surprising among these terracottas is a solid sphere (Figure 8)

8. Miniature terracotta model of an air-inflated ball, probably early third century B.C., from the inhumation burial in the *pithos*. Diameter 1¾ inches.



9. A fragmentary *oinochoe* in the form of a Negro head, probably fourth century B.C. This vase came from the debris of a destroyed tomb in the South Necropolis. Preserved height 5⅜ inches.

10. Inhumation burial on tiles, from the Augustan period, in a re-used slab tomb of the South Necropolis. The skull is visible toward the far end. Tomb furnishings were heaped near the legs and feet.

which seems to be a model of an air-inflated ball. The markings on the surface suggest polygonal sections, probably of leather, sewn together, and along one of the lines a raised ridge flanked by little black dots must represent the laced opening through which a bladder would have been inserted. This representation, instantly calling to mind a modern basketball, may reproduce in miniature the *follis* of which Martial speaks (*Epigrammata* 14.74) and of which we have never had a sure illustration.

These terracottas from the great *pithos* are the earliest in the South Necropolis, but in later burials figurines are not uncommon, at least through the early Roman period. Although a great variety of human and animal subjects is represented, it is surprising that only two tombs contained draped female figures of the type so common elsewhere in Hellenistic cemeteries. At the same time the drinking vessels characteristic of the cremation period become rare and, except for a few bowls, make their last appearance in the earliest inhumation graves. They are replaced by small perfume bottles and flasks of clay or, later, of glass, unglazed cooking pots and jugs, cylindrical ceramic boxes and, most striking of all, plastic vases in the form of heads (Figure 9). Coins, aside from those mentioned above, do not appear at all until the Augustan period, but various tombs yielded miscellaneous objects such as lamps, strigils, gaming pieces, needles, bone and lead boxes, and many others. There seems to have been no set system for the arrangement of these offerings in the tombs. In some they were disposed neatly around the body, while in others they had evidently been tossed in helter-skelter.

Not all the tombs contained rich furnishings, of course. Some held only one simple object such as a clay unguent flask, and many contained nothing at all. While the history of the cemetery can be followed in unbroken sequence through the centuries, it seems that the late Hel-

11. *Below:* A brown glass bowl with cut bands, Augustan period, from the burial illustrated in Figure 10. Diameter 4⅛ inches.

12. *Right:* Cylindrical ceramic box (pyxis) with three claw feet, Augustan period. The upper part of the pyxis is visible among the objects in the burial illustrated in Figure 10. Height 7½ inches.

13. Fragmentary silver earrings, Augustan period, found near the head of the burial in Figure 10. Approximate length 3 inches.

lenistic period was a time of poverty in Samothrace, at least as far as our evidence now goes. In the first century B.C. and the early years of the Roman Empire, however, a new series of splendid burials was installed. Figure 10 shows a burial of this time: a usurper laid on tiles near the top of a slab tomb of a previous era, with a large group of objects placed near the legs and feet. These included a delicate, honey-brown, molded glass bowl (Figure 11) and a large cylindrical box (Figure 12). There were also terracotta figurines, perfume bottles and coarse jugs, of which one was made into an incense burner by placing a perforated cup over its mouth. At the head, marking this as the grave of a woman, was a pair of silver earrings with amphora pendants surmounted by discs set with paste stones, and the twin feathers of Isis (Figure 13). Scarcely a single tomb gift is a duplicate of any other, and each tomb has its special character.

IN GENERAL, the tombs of the South Necropolis confirmed the impression of Samothracian funeral customs given by the partly excavated cemetery at the hotel. There too cremation was the customary, although in that case not the exclusive, rite of the Archaic period and the fifth century, and the late fourth century saw the introduction of inhumation in slab tombs and *pithoi*. There too tile tombs prevailed after the third century B.C. However, one striking difference between the two cemeteries was noted. At the hotel site the tombs were thinly spread over a large area, seldom encroaching or intruding on one another. Fill was never brought in to increase the usable space. Instead, the cemetery seems to have been gradually extended as need arose. In the South Necropolis, on the other hand, the fill, the burned layer and much of the earth below were solidly packed with burials. They jostled and intruded on one another, and earlier installations were often destroyed to make way for later graves, as was plain from many jumbled heaps of broken tiles, bone scraps and tomb furnishings, as well as large fragments of vessels which must have come from cremation burials. Not infrequently a tomb was found intruding into another which must have been nearly contemporary with it. In only two cases was there evidence that those who dug holes in which to build slab tombs or place large jars were not completely indifferent to previous burials. These were two deposits of cremation burials, found in the upper fill near large Hellenistic tombs, which contained ash-filled vases dating from the mid-sixth century to the late fifth. These had been gathered together and rather carelessly packed into crude stone compartments. Such respect, however, was plainly the exception.

What was it that, with all the barren areas available in Samothrace, made this little patch of river bank so cherished as a burying ground? The attraction of the nearby sanctuary immediately suggested itself and lent us the hope that these dead had some special connection with the religious center and that some new light might be cast on its mysteries by the finds. Unfortunately no such connection can easily be made, and any religious associations which can be discerned point to other cults, such as that of Isis. We are left with another Samothracian mystery and can only conclude at present that, whatever the cults these people adhered to, the importance of the grave in regard to both furnishings and human remains, was transitory. It may have been felt that after a certain time, perhaps the time needed for the dissolution of the flesh, the deceased had concluded his journey to the next world and no longer had need of his tomb or his possessions. Such a belief would explain why disturbances of the burials were permitted; and the conviction that this was the case helps to salve the conscience of the modern grave robber who, however scientifically, completes the work of destruction.

THE SILVER CUP OF HASANLU

ARCHAEOLOGY is privileged to publish here for the first time a photograph of a silver cup which, like the now famous gold bowl, was found in the ruins of the Burned Building (mid-ninth century B.C.) on the top of the citadel mound at Hasanlu Tepe, in Azerbaijan, northwestern Iran. This stronghold of the Mannaeans was possibly destroyed, according to Mr. Robert H. Dyson, Jr., leader of the joint Iranian-American expedition to the site, by the Urartians from the area of Lake Van in eastern Turkey, who left a record of their victory in two rock inscriptions not far from Hasanlu.

Earlier this year ARCHAEOLOGY (12 [1959] 65-66) carried a brief account of the 1958 campaign conducted by the Joint Expedition of the University Museum of the University of Pennsylvania and the Archaeological Service of Iran. It was during this campaign that the silver cup and the gold bowl were found—in the same level of the Burned Building but in different rooms. The bowl was first published in the *Illustrated London News* of September 27, 1958, and later was lavishly displayed in *Life* magazine. Later we hope to give an account of the 1959 campaign, just concluded, in which the Metropolitan Museum of Art of New York City also participated.

Publication of the silver cup, which is in the Museum of Ancient Iran, in Teheran, has had to await its careful cleaning. The impression of cloth, both inside and outside, shows that the cup had been carefully wrapped and stored somewhere in the room in which it was found. The overlay decoration, in electrum, consists of two registers of figures and a band of ornamentation around both the rim and the base. The upper register shows a chariot drawn by two horses and carrying three persons; two soldiers parade behind, followed by a horse and a man who is raising his spear over the horse's flank (not shown in this view). On the lower register are two confronted animals with human figures. Height of cup about 8 inches.

Photograph courtesy of the Joint Expedition of the University Museum of the University of Pennsylvania and the Archaeological Service of Iran.

By OLIVER DAVIES

THE EQUIPMENT OF AN ACHEULIAN MAN IN AFRICA

PREHISTORIC STUDIES in West Africa are a very recent science. Over most of the sub-continent there are no ruins to attract attention. Even the earthen mounds, which stand out from the landscape, belong to comparatively modern times, for until recently men lived in flimsy grass huts or in the open and migrated frequently, giving no time for rubbish to accumulate. The prehistorian, therefore, cannot seek local information. In Europe he may ask where there is an old fort, or standing stones, or a cave, or ruins. If he tries this in West Africa, he will suffer agonies of frustration, incomprehension, misleading information: if he succeeds in getting his meaning across, he will be suspected and probably fobbed off with lies; he is more likely to be met with a blank stare of ignorance.

As there are very few ruins, he must look for objects; and he must rely on himself to know where and how to look, what sites are likely, at what depth in the soil he may find things. In the drier regions of East and South Africa and near the Sahara, nature and the peasant will have done much of the work for him. Grass-burning and consequent erosion will have carved out the soil and revealed its contents beneath the surface. But most of West Africa is still protected by heavy vegetation, long grass bush and forest, which effectively blankets everything. So the prehistorian must rely on public works, railway cuttings, road cuttings, gravel pits, pipelines, building foundations and so on. He cannot set out to excavate; he has no clue where to begin. As O. G. S. Crawford used to preach, it is only after careful surface survey that excavation should be attempted. In Ghana, a developed and wealthy territory, I have picked up thousands of objects in public works; I have been able to examine hundreds of sections left by road-men, and to select sites for scientific excavation where significant questions could be asked and answered.

On a hot afternoon over a year ago I was driving slowly northward along the main road which leads from Abidjan into the interior. I was not far north of the boundary between the Ivory Coast and Upper Volta, and had just crossed at Diarabakoko the upper Comoe River, one of the few permanent watercourses in this gently undulating savannah (10° 22′ N 4° 43′ W; see map). For the last two or three weeks my survey had not been productive. There had been few sections; subsoils were thin and objects in them scarce—I had found little evidence to determine the stratification and build-up of soils. Now I noticed on the gentle slope from the Comoe

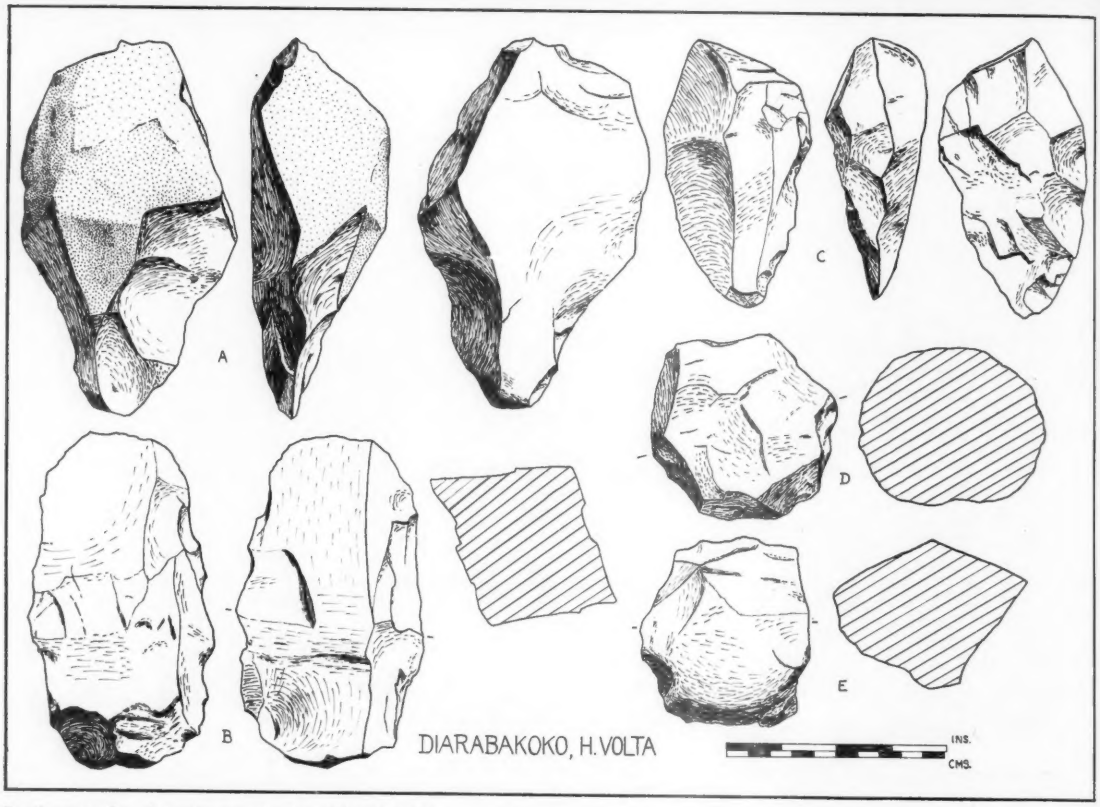
MAP OF CENTRAL PART OF WEST AFRICA

Valley a fairly large gravel pit. I was tempted to drive on; there would be nothing in this pit, as there had been nothing in fifty other pits I had looked at. But I decided to stop, and this fifty-first pit finally yielded me my reward.

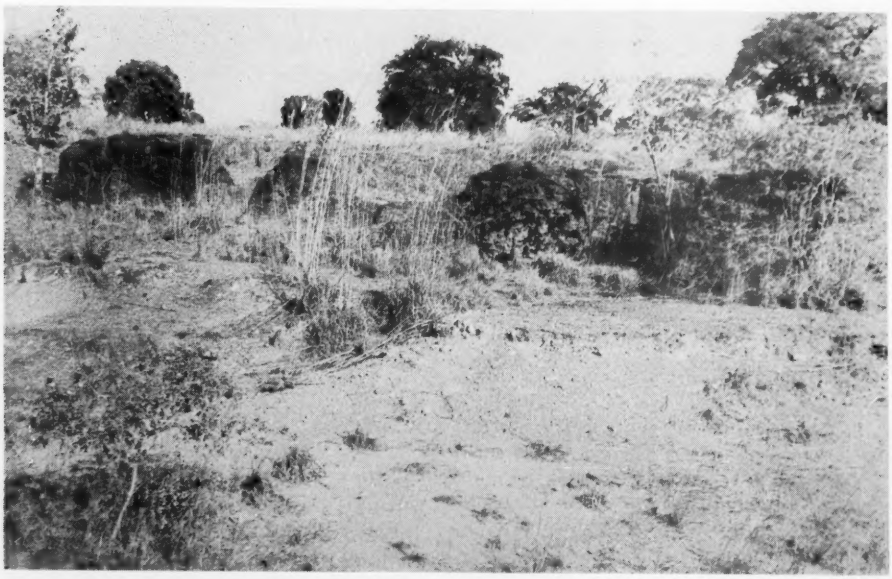
Operations in the pit had removed the cover of one or two meters of block-laterite and had exposed beneath it a thin layer of rubble, consisting of quartz chips with a few pebbles. A patch of the rubble also had been dug, so that it stood out like a step over the underlying boss of sandstone. Rubble-lines are common in West Africa. As the rock weathers, its more resistant constituents, especially fragments of quartz veins, are not washed away but spread. The rock surface in this pit was about eight meters above the River Comoe. It is not a true terrace, and the rounded pebbles in the rubble must have been derived from an eroded river terrace at a higher level.

When I entered the pit, I noticed five prehistoric implements lying on the rubble within an area of one square meter. They form a single collection, and it is reasonable to suppose that they were the equipment of one man, who probably had met death on that spot, since in no part of the world is there evidence for ceremonial burial in old Palaeolithic times. It is most unusual to find such a group of implements. Where prehistoric man went, he usually went frequently, over tens, hundreds and thousands of years; he dropped and left his tools here and there, and it is impossible to sort out what belonged to one man rather than to another. In the rubble of the Diarabakoko pit there were a very few other crude implements, scattered here and there but not forming a single collection; nor were they well finished like those of this group. We may suppose that men visited the banks of the Comoe so rarely that they left little there.

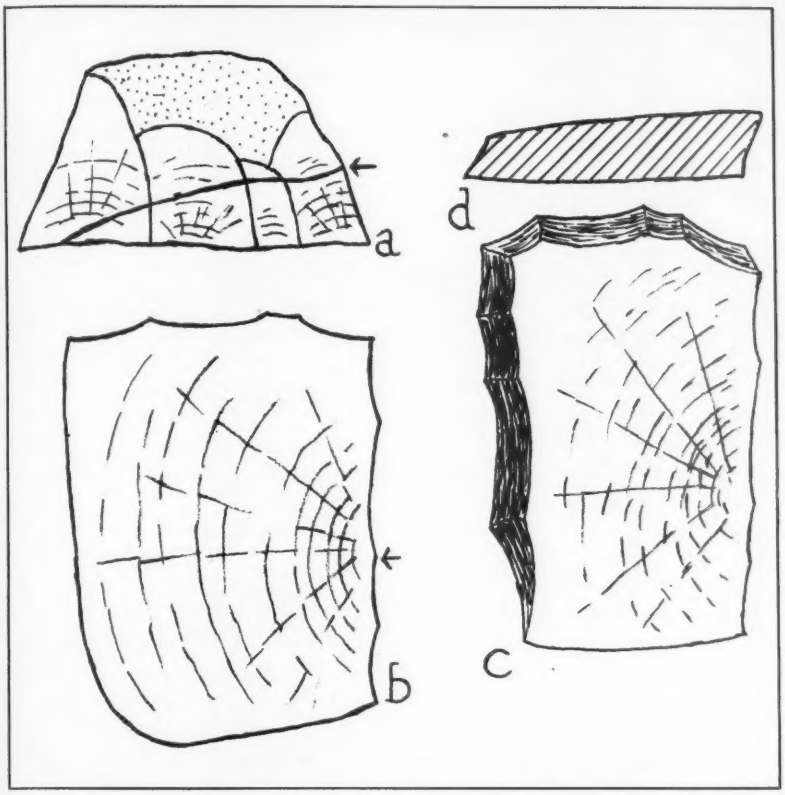
The pit yielded some evidence for the subsequent history of the area. Without going into technical details, one may say generally that laterite is subsoil cemented by iron salts under tropical conditions; as it accumulates, one may expect intermediate land surfaces in it. It may be



Implements found in the gravel pit at Diarabakoko.



The gravel pit at Diarabakoko, where the implements were found.



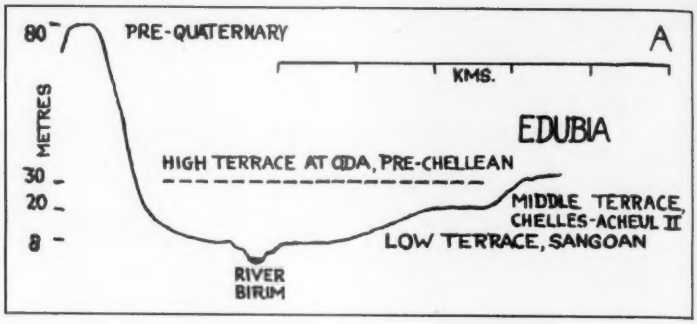
Hoenderbek core and cleaver made from it. Diagrams based on Söhnge Visser and van Riet Lowe, *Geology and Archaeology of the Vaal River Basin (South African Geological Survey, Memoir No. 35)* page 83. **a)** Trimmed core, seen from end, with flake struck. **b)** Flake as struck. **c)** Flake trimmed on left to make cleaver, leaving blade at bottom. **d)** Rhomboidal cross-section of finished cleaver.

ACHEULIAN MAN continued

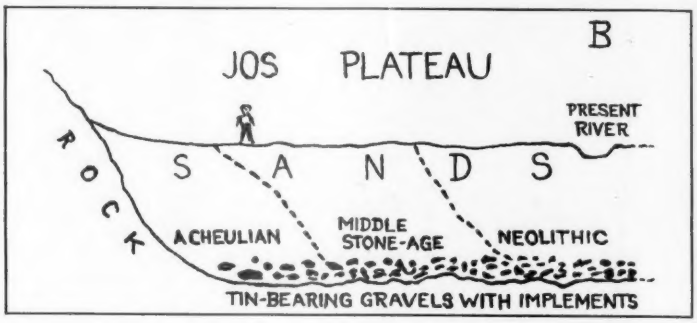
easiest to explain the build-up at this site in tabular form:

Very thin soil On the laterite, microliths Sterile laterite	Comparatively recent
In the laterite, traces of a surface with Late Sangoan tools (the African equivalent of the European Mousterian)	Early Late Palaeolithic
Sterile laterite Rubble with Acheulian tools Eroded rock surface	Early Middle Palaeolithic

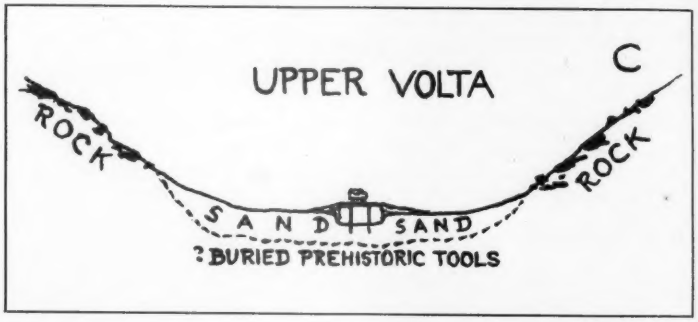
Of the five implements under discussion, the three largest are of hard sandstone: a hand-axe **(A)**, a cleaver **(B)**, perhaps used as a skinning-knife, and a smaller hand-axe **(C)** which may have been used as a dagger. The other two are of quartz: a stone-ball **(D)** and what may be another missile-stone or a chopper **(E)**. It has been claimed and often assumed that stone-balls were attached to thongs in threes like the South American bolas (S. Cole, *Prehistory of East Africa,* 142 and references on page 290); but for this there is little positive evidence, and it is more likely that they were missile-



Diagrammatic section (A) of river-terraces at Edubia and Oda in Birim Valley, Ghana.



Diagrammatic section (B) of valley-fillings on the Jos Plateau, Nigeria; based on diagrams exhibited in the Jos Museum.



Diagrammatic profile (C) of a valley in Upper Volta, not yet sectioned to bedrock.

ACHEULIAN MAN continued

stones, probably thrown from the hand without a strap.

These tools can be assigned to a known stage of the African Palaeolithic. The hand-axe **(A)** and the cleaver **(B)** are side-struck; that is to say, they are made from large stone flakes which have been detached by a blow on the longer side. This is best seen on the cleaver, which exhibits the rhomboidal section peculiar to this technique. A suitable mass of stone was trimmed to the shape of a rough pyramid, with rectangular base. It was then struck on the side to detach a large flake which, with a minimum of further trimming, would yield a serviceable tool. The core whence the flake is struck is known in South Africa as a Hoenderbek (Fowl-beak) core.

This technique was seldom applied in Europe, because there man normally made his tools of flint nodules which, with a little trimming, were of suitable size and weight. In Africa he sometimes was able to select river-rolled or beach pebbles of convenient size, which could be shaped by detaching a few flakes; but he often had to use large pieces of rock, of which he would be able to manipulate only a fragment.

In the deposits on the Vaal River in South Africa, van Riet Lowe traces a development of the core-technique *(Proceedings of the First Pan-African Congress,* 167). He assigns the Hoenderbek core to Chelles-Acheul III (Early-Middle Acheulian), and with Chelles-Acheul IV he associates another type of core (Perdehoef, or Horse-hoof), from which the large flakes were struck

at the end. It is doubtful if this distinction holds in West Africa, as in Ghana I have found Hoenderbek cores apparently in the much later Sangoan contexts.

We may, at any rate, assign the Diarabakoko collection to Chelles-Acheul III-IV, corresponding to the Early and Middle Acheulian in Europe. Apart from the human interest, as illustrating how a man of that time equipped himself, the collection is important from two points of view. Many tools of Chelles-Acheul III-IV have been collected from the tin mines around Jos in northern Nigeria (H. J. Braunholtz in *Geological Survey of Nigeria, Occasional Papers,* IV; B. Fagg, *Congrès internationale des Africanistes de l'Ouest,* iii, 203); elsewhere in West Africa they are practically unknown, though tools of an earlier (Chelles-Acheul II) and of a later stage (Chelles-Acheul V and Sangoan) almost pave the ground near the coast in parts of Ghana and Togo. This distribution was conditioned by the equatorial forest. Primitive man would have had difficulty in penetrating the forest through the dense scrub which usually fringes it; and when he did penetrate, he would find little to eat. He must have lived largely on game and carrion, partly on leaves, tubers and insects. As he hunted by sight and not by smell, he had to keep to fairly open country; savannah would also yield a better harvest when he grubbed in the ground. In the high forest anything edible would be at the tops of the trees, beyond his reach.

A fairly concordant climatic sequence is being established for all parts of tropical Africa. It is agreed that in the past rainfall has varied, and these variations have caused the forest to extend or to shrink. We know also that the Chelles-Acheul III-IV industries belong to a wetter period, while at the periods of Chelles-Acheul II and the Sangoan it was much drier. The distribution of these industries in Guinea reflects the changing climate. When the rainfall was high, man moved a long way north. The upper Comoe Valley, with about 1200 mms. of rain annually, and now open grassland, was visited rarely; around Jos, farther north, there are abundant traces of man. But in dry periods man was able to reach the coast and occupy much of what is now forest; areas which now receive more than 1500 mms. of rain may have had 700 mm.; what is now forest was open grassland, and what is now grassland may have been desert.

THE AUTHOR studied at Oxford University and, after three years at the British School of Archaeology at Athens, was appointed to the University of Belfast in 1930. He worked for many years on ancient mining and on the prehistory of Ulster. During part of the war he held a post at the University of Istanbul. From 1948 to 1952 Mr. Davies was Professor of Classics in Natal, where he was able to trace the main outlines of the prehistory of the province. He then was appointed to the University College of Ghana, and is now doing research on West African archaeology.

The Diarabakoko pieces are probably the first belonging to the hand-axe culture to have been found in the territory of Upper Volta. This large area is still archaeologically a blank. But this one find gives hope of more and is moreover a pointer where and how to look.

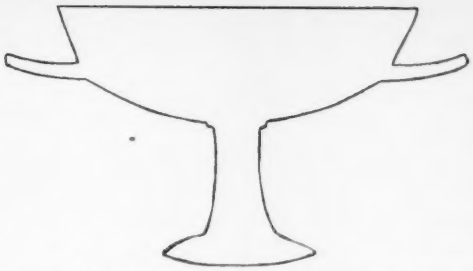
Stone Age finds in Africa are frequently made near rivers—malaria and other diseases which now drive man from river valleys must be of very recent spread. But in the gentle relief of West Africa, river deposits are liable to be buried rather than exposed. The Gulf of Guinea has receded some fifty meters vertically in the last half million years; a similar lowering of the oceans has been recorded in most parts of the world. In consequence, rivers flowing into it have cut their beds down; and for climatic reasons this dissection took place not continuously but in a series of steps. The rivers meandered in their valleys, and the remains of old valley floors have been left as river terraces perched a good many meters above the present beds. It was in the old valleys that prehistoric man often lived; so we find his tools deposited according to age on the different terraces (see the schematic diagram of the Birim Valley, **A**).

As one advances inland toward the plateau and the watershed, the valleys have cut down much less. Near the coast, the latest terrace is at 8-10 meters above the present rivers; in the northern Ivory Coast, at Béoumi and Léraba Bridge, the oldest terrace is at only twelve meters. The rivers have incised very shallow valleys, filled them with silt, then eroded the silt again without further cutting into rock. As a result we do not find a set of steps on which tools of different ages are neatly deposited. The tin miners at Jos have revealed sections which show how deposition has proceeded (see diagrammatic section, **B**). Valleys have silted, eroded, silted and eroded again, and silted in modern times. Each silt deposit contains its particular type of tools; but as they are buried, hardly a single piece would have been discovered if there had been no tin mining. In Upper Volta and other parts of West Africa there has not been a similar economic incentive to digging out the valleys (see diagram, **C**); and the archaeologist with limited resources cannot afford to do so. As these territories are modernized, the construction of massive dams and other works may section valleys to bedrock. I have little doubt that in the buried deposits sequences of Palaeolithic occupation will be discovered similar to those at Jos, to demonstrate the presence of man for as long a time as we have been able to demonstrate near the coast. Africa is a very ancient area of human occupation; and though West Africa may not be able to carry back to the very beginnings of humanity, it undoubtedly has a respectable record compared to other continents of the globe.

BIRDS
on the cup of Arkesilas

By Sylvia Benton

The Arkesilas cup: view of the interior. Ca. 550 B.C. Photograph courtesy of the Bibliothèque Nationale.



Profile of the Arkesilas cup. From *Corpus Vasorum Antiquorum, France, Bibliothèque Nationale I,* plate 20.

AMONG THE THOUSANDS OF VASES which have survived from ancient Greece, one of the most interesting is the Arkesilas cup, so named from a dignified figure depicted on it, with the name Arkesilas written beside it. Pottery made of a fabric like that of this vase has been found all over the Greek world, from Taranto to Samos, but because Arkesilas is known to have been the name of more than one ruler of the Spartan colony of Cyrene, in North Africa, it was supposed that such vases originated there. Excavation has shown, however, that the fabric was made in the town of Sparta in the Peloponnesus, and so the excavators called it Laconian, after the Latin name of the province. The literature on the Arkesilas cup is enormous (*Corpus Vasorum Antiquorum, France, Bibliothèque Nationale I,* plates 20, 21, no. 189), and I cannot claim to have studied it all. I content myself with building on the foundations laid by E. A. Lane in his study of Laconian pottery (*Annual of the British School at Athens* 34, 161). The cup was made about the middle of the sixth century B.C.

On the left of the picture on our vase there is a king seated on a stool; he is labeled Arkesilas, so the scene is presumed to be set in the Spartan colony of Cyrene. The king is watching a weighing operation presided over by a man, at the far right, from whose mouth proceeds the word *sliphomachos.* It used to be supposed that this word referred to the plant *silphion,* used as a drug, which was exported from Cyrene, but Lane pointed out that the white substance being weighed is not *silphion,* but wool. The meaning of the word ἰρμοφόρος beside one of the porters is not clear, but it seems to be a question of weighing and storing wool. (Incidentally, I met the transposition of *sil* to *sli*—as well as of *r* to *l*—when I was digging in Ithaca: my foreman habitually spoke of σλίμα and it took me a long time to find out that this word was σύρμα, meaning wire.)

Lane was right in saying that Arkesilas is sitting under an awning, but surely not in suggesting that he is on dry land. He thinks that the awning is on dry land because ships in port have their sails furled. The various elements, however, are better explained by assuming that the scene takes place on board a ship in port. Modern Greek seamen often unbend a sail in port and use it as an awning on board, and this perhaps is what is intended here. The rather narrow rectangular piece of cloth is the ordinary shape of an early sail; it is fitted with rings holding ropes, and one end is still in place, at the end of the spar, which, it is to be supposed, is still lashed to the mast. The ropes on the far side of the awning (at upper left) may be attached to the yard, mast or shrouds. A light vertical post, or posts, is the *sine qua non* of an awning on shore, and of a post there is no sign.

Where are the baskets being stored? In a cellar under the courtyard? The upper floor must be in the open, because of the birds and the awning. The baskets shown between the floors bind the two scenes together. The lower room, then, is likely to be the hold of a ship. The curved support below, on the left, may be the support of the stern or of the prow, on which Arkesilas is sitting. The feet of the tally clerk, who is counting the baskets being stowed below, impinge on this support, so he is evidently sitting alongside it, not behind it, where he could not see what is going on. People are often shown at different levels on board ship, whereas a sectional view of a cellar under a courtyard is unknown in Greek art. It

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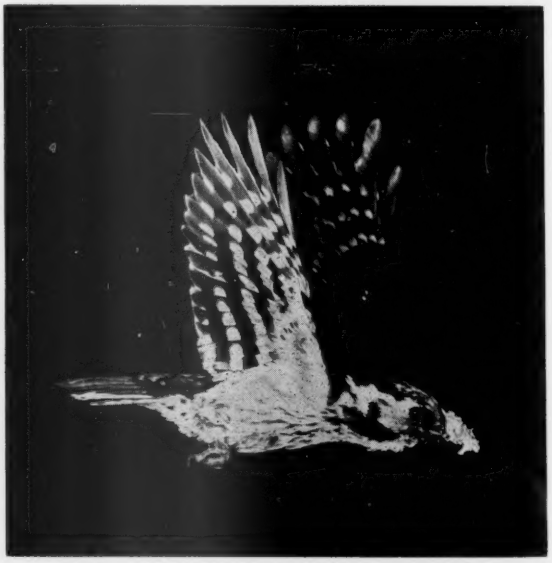
SYLVIA BENTON, M.A., B.Litt., has spent many years in Greece, where she excavated in Macedonia and in Ithaca. She has also conducted excavations in Scotland, which are published in the *Proceedings of the Society of Antiquaries of Scotland.* Miss Benton previously made a special study of early Greek vases and of metal work. Her present interest is the identification of birds in Greek art. This article is introductory to a general study of the subject.

Photographs of the birds by courtesy of Mr. Eric Hoskins.

Lesser Spotted Woodpecker. This variety is not absolutely identical with the Middle Spotted Woodpecker, the one probably shown on the Arkesilas cup, but the Greeks certainly would not have noticed any difference.



A woodpecker in flight. Note how the toes are curled up, in contrast to those of the stork.

A stork in flight. Note how the toes are stretched out.

is true that most Greek artists depicting a ship made their purpose clearer, but this painter is breaking new ground. He has, however, given one more hint of travel by showing us a long-necked bird, probably a stork, in flight (at upper right). Such a bird is shown flying near a ship on a Greek funeral vase (*Corpus Vasorum Antiquorum, France, Louvre XI,* plate 3 A527) and may sometimes be connected with death, but not on our cup. The painter has made the bird's legs too short, probably because he had not room for them, and he has incorrectly curled up the toes—Greeks had no binoculars. Raised wings of a flying stork should give a triangular figure, but here the space to be filled is rectangular, so the wings are made rectangular too.

Wool is never stored permanently in baskets: the moths see to that. It would only be put into baskets for ease of handling in transit during a journey. It is evident, then, that the picture represents the Cyrene export trade, as has generally been supposed. Lane translates the foreman's order, ὄρυξο (written below his pointing hand), as "Lower away." My dictionary says it means "dig in." The foreman is certainly pointing up toward the bird, and both he and the porter beside him are looking in this direction. The word *sliphomachos* coming out of his mouth may well be what he says, not—as Lane suggested—what he is. He is demonstrating something to his companion. The attitude of these two men is just that shown on a famous Attic *pelike* (two-handled jar) where a boy points out the first swallow to a man: ἰδοὺ χελιδών, says the boy—"Look, a swallow!"

Σίλφη *(silphe)* is a word used to denote various insects: by Aelian (*De Natura Animalium* I.37) when writing of the infestation of swallows' eggs, by Aristotle (*Historia Animalium* VIII.17.8) for an insect that casts its skin; hence "insect-hunter" is a good translation for *sliphomachos.* If we follow the foreman's pointing finger we arrive at the Insect-hunter. It is a bird like a woodpecker, and it is looking for insects on the spar. "Dig in," orders the foreman, addressing the bird.

A woodpecker does not always dig with his beak; he may tap, and the vibration in the hard material containing the soft body of a beetle larva pinches the creature and out he wriggles, to be seized by the long, barbed tongue waiting for him. Aristotle (*Historia Animalium* IX.9) knew the process, and so does the foreman. His attention has evidently been taken from the job of tying the basket; his right hand is still holding the fastener. He has heard the tapping—this woodpecker taps like a machine gun—and he expects the bird to dig for the insect. (Mr. George Watson, of Yale University, points out that the woodpecker pursues beetles as well as their larvae, so this bird is well entitled to be called *sliphomachos,* for *silphe* certainly is used of beetles. Mr. Watson's report that some moderns call the woodpecker

μυρμιγγοφάγος (ant-eater) offers a nice parallel to the ancient *sliphomachos*. Greek trees swarm with ants.)

There is another woodpecker on the yard similarly employed, and a third is flying to join them. The ship is apparently so heavily infested that all the woodpeckers in Cyrene are attracted. No good saying that woodpeckers do not usually peck spars. This is what the painter has painted. Incidentally, there do not seem to be woodpeckers in Egypt, but *Dendrocopus Medius,* the Medium Spotted Woodpecker, has been observed on Mount Taygetus, near Sparta, which is well wooded. It may be only chance, as birds were heavily stylized in the sixth century, but the woodpeckers on the Laconian cup do look like spotted woodpeckers. The real birds are black and white with red patches, but this artist is probably not concerned with natural colors.

We can see why the foreman, who is probably also the boatswain, is so much interested in insects. If the spar is rotten, the crew may have to row home; or if the infestation goes further, they may even have to swim for it. If I am wrong, and the scene takes place on land, the insects would be of less vital interest. In any case the painter appears to be something of an ornithologist: he has caught the difference in flight between land and marsh birds.

Since it is now agreed that the workshops of Laconian vases were in Sparta and not in Cyrene, it is surely time to modify the theory of close influence from, or even imitation of, Egyptian tomb painting. Lane says: "The similarity of the subject to certain Egyptian wall-paintings is unmistakable." This cup cannot have been made for the tomb of Arkesilas. The attempt to claim that other Laconian vases have chthonic significance has been met with strong opposition (Andronikos, *Peloponnesiaka* A) and some ribaldry. Lane, in discussing another Laconian cup, pointed out the impropriety—and hence the unlikeliness—of putting irreverent padded dancers just under figures thought to represent the heroized dead, and the Insect-hunter on our vase is just as damaging to the theory that it had a funerary function. A seated figure is a commonplace in Greek art of many periods and is not associated only with scenes of the dead. If the painter happened to have passed by the sanctuary of Penteskouphia, near Corinth, he could have studied scenes of contemporary commerce depicted on clay tablets which were dedicated there. One votive tablet found at this shrine shows the export of vases; others show the making of pots.

The idea of a ruler superintending the commerce of his country probably comes from Egypt. It is not required that the artist should have seen any originals himself; hearsay would be enough, and this artist is not attempting to paint an Egyptian picture. In fact, he has placed the scene not in Egypt but in Cyrene. Although the name Arkesilas should probably be connected with Cyrene, there is no reason to insist that an Arkesilas was king of Cyrene when the vase was painted. Anyone at any time may paint a picture of King Alfred and his cakes or of George Washington and his hatchet.

If we come down to small details, we find (as Miss R. L. Moss tells me) that there is no sign of wool in Egypt until much later. And just look at the method employed on our cup: wool balanced against wool, in loose bundles. The operation is completely bogus, and yet the king seems to be giving it his best attention. It is not clear whether Arkesilas is being attacked personally, or whether commerce in general is being pilloried, but it is certainly a satirical kind of cup.

Too little attention has been devoted to birds in Greek art. They are decorative, but generally not only decorative. On our cup I believe them to hold the key to the meaning of the picture.

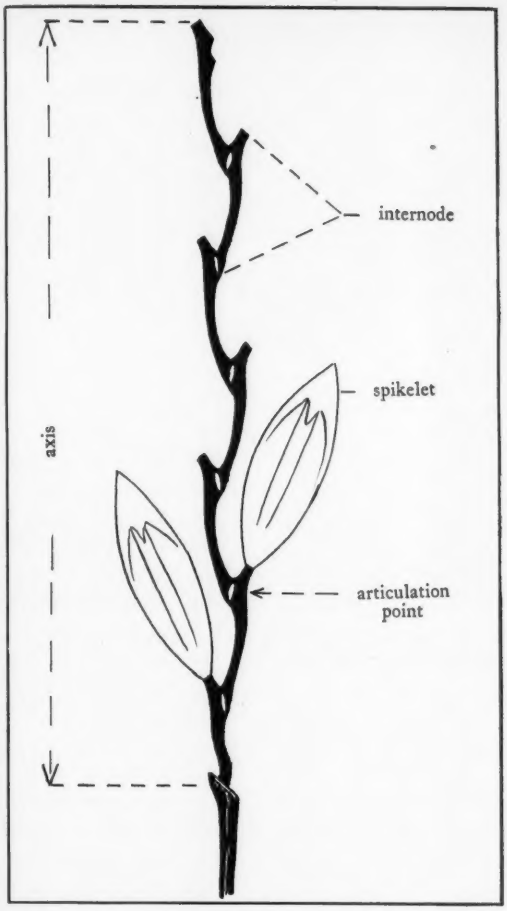


Diagram showing the parts of a grass (cereal) spikelet.

HOW FARMING BEGAN IN THE OLD WORLD

By HANS HELBAEK

A VITAL TURNING POINT in the history of man was the change from the food-gathering perambulations of the Palaeolithic era to a sedentary life of plant husbandry and animal breeding. To an ever-increasing extent archaeologists are subjecting this period of transition to intense scrutiny. Evidence long known is being reappraised, and new approaches to this interesting problem are being tried. A fundamental element in modern research is cooperation between archaeologists and natural scientists—a merger of interests and resources that has already had promising results.

Before the discovery of agriculture the struggle for life was hard and uncompromising. The adult individual who could not support himself perished, and only the sturdiest and shrewdest reached the age of maturity. Multiplication of the race was infinitely slow.

With the advent of the sheltered life of the sedentary farming community, the hazards became less. Dangerous traveling was no longer necessary, and protection against the climate and wild animals was provided by many families living together in appropriate dwellings set in an environment chosen by themselves. The supply of food was available all year round, and production could be increased according to need. Thus the domestication of plants and animals laid the foundation for the rapid increase in population which is the most conspicuous feature of the early phase of the Near Eastern village-farming cultures.

While animals were, indeed, a most important element in the economy of these early communities, what people were after was arable land rather than just pastures for their animals. It is no exaggeration to say that the possession of wheat and barley was the principal factor in the subsequent rise in technical and spiritual power of the Oriental, the Mediterranean and, finally, the western European peoples.

DOMESTICATION of plants and animals doubtless started independently in several places at different times. Even in the Near Eastern area there may well have been more than one focal point, although this would be difficult to

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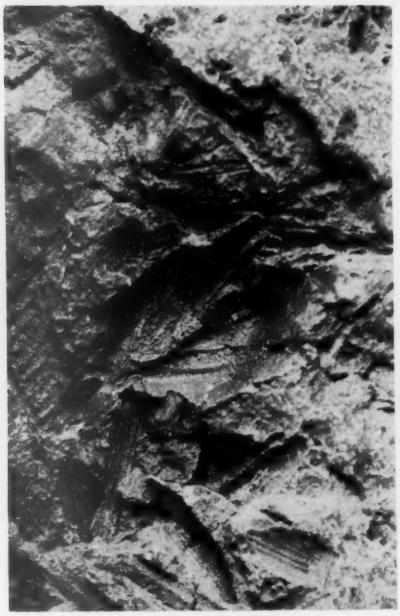
THE AUTHOR, who is on the staff of the National Museum of Denmark, is a palaeoethnobotanist (a specialist on prehistoric cultivated plants) dealing with the Old World. His studies—which have resulted in some thirty-five articles—are based on observation of actual plant material excavated in the Near East as well as in southern, western and northern Europe. Dr. Helbaek, who holds the honorary degree of D.Sc. from the University of Reading, England, has been the botanist member of expeditions to the Near East sponsored by the Oriental Institute of the University of Chicago. The excavations at Jarmo which he mentions were reported in ARCHAEOLOGY 5 (1952) 157-164. The present article is based on a paper presented by Dr. Helbaek at the Fifth International Congress for Pre- and Protohistory at Hamburg, Germany, in August, 1958.



Imprints of grains from Jarmo. *Left:* Wild-type Emmer spikelet. *Right:* Typical domesticated Emmer spikelet. *Opposite page:* Sterile two-row barley spike section (triplet).

HOW FARMING BEGAN CONTINUED

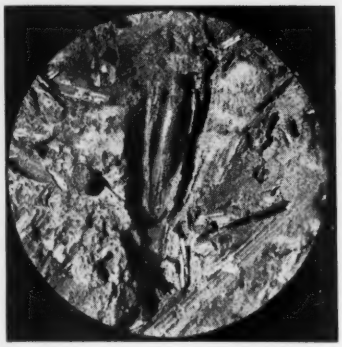
demonstrate, as the same environmental conditions affected development all over this area.

As far as we know today, the earliest attempt at food-producing took place in the Near East. What was the reason for its unparalleled success? Apart from certain legumes, the main plants which were domesticated were wheat and barley, and this fact proved to be fundamental for the spread and stamina of the cultures which originated in the native lands of these cereals. No other cultivated plants surpass these two in versatility; only these species have proved capable of developing forms which are able to adapt themselves to greatly varying soils, climates and altitudes. Today, specialized varieties of wheat and barley are grown from Japan to Ireland, from the North Cape to the Equator, from nine hundred feet below sea level in the Jordan Valley to more than twelve thousand feet above in the Himalayas.

It is axiomatic that the domestication of a plant must begin where the plant is available in the wild state. Now, wild barley is distributed from Turkestan to Morocco, but we know nothing of initial domestication in places other than the center of this large area, the so-called "Fertile Crescent." (This phrase was coined with reference to the great river-valley cultures of much later times in Egypt and Mesopotamia.) More important in this early period than the fertile alluvium, which later played such a large rôle, were the "hilly flanks"—the foothills of the highland area which borders the Fertile Crescent —for here the large-grained wild wheat called Emmer is found, along with wild barley. The latter might have been domesticated at any place from Central Asia to the Atlantic, but since we know of no ancient culture based upon barley alone, the conclusion is inevitable that wheat was the plant which tempted men to take the step which was to have such momentous effect on the development of human society. Both wild Einkorn and wild Emmer are distributed in this central area, but Emmer occurs only on the southeastern fringe of the Einkorn area.

In wild grasses the spike axis is brittle. This is an important quality, for the individual spikelet, with the grains still in it, is released at maturity and subjected to transport by wind and animals. In some grasses, for instance the wild cereals, there is a recessive tendency to develop a tough axis, and the grains of such tough spikes lose their ability of dispersal. All the grains fall with the spike in one spot, and all but a few are choked in the competition.

When man started to sow and reap the wild wheat, this recessive quality became an asset to him. He was

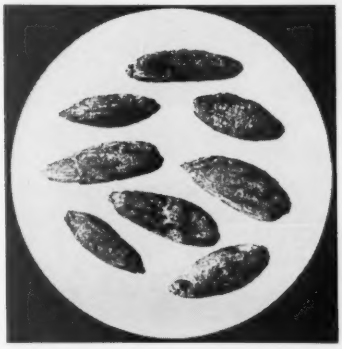


Wild-type Emmer spikelet (cast) found at Jarmo, with spikelet of present-day wild Emmer.

apt to get the whole spike only when it was tough, while he would lose a certain amount of the grains of the brittle ones. Thus the tough-axis genes enjoyed priority in his harvesting, and eventually, as his technique became more summary, only the tough spikes were recovered. This was the actual act of domestication, as the tough-axis cereals were no longer able to exist without the agency of man. They had become the serfs of man, but at the same time man had become the servant of the cereals, having made his new mode of life dependent upon them.

Since wild wheat grows in medium altitudes, usually 2500 to 3000 feet above sea level, and preferably on dry and sunny slopes, it was necessary to move it down from its natural habitat. This encroachment upon its nature increased the rate of mutation, while physiological and morphological changes began which eventually led to the formation of thousands of varieties and strains, with vast ability of adaptation.

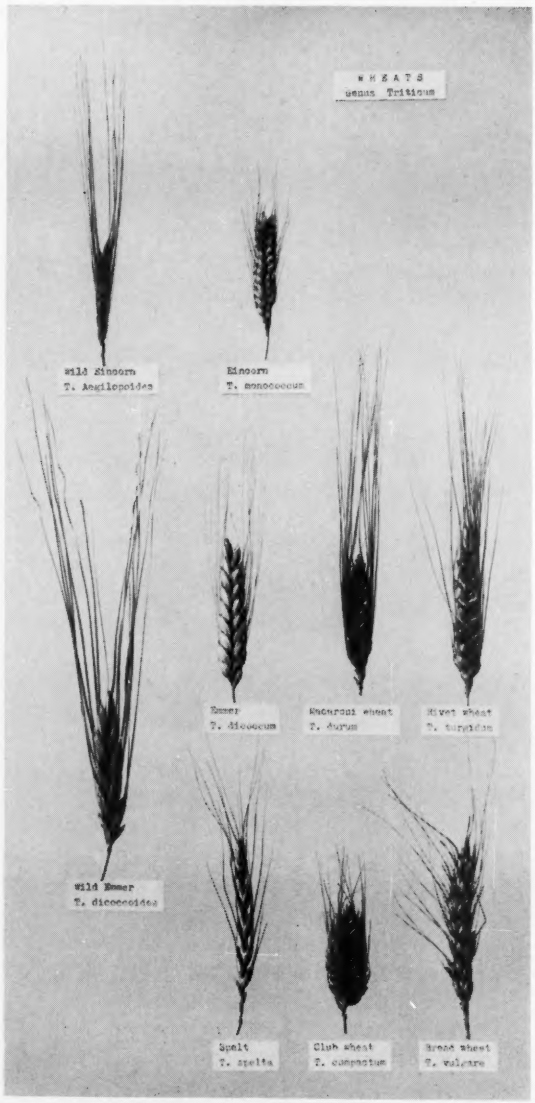
Jarmo, in the Kurdish area of northeastern Iraq, is the first prehistoric site where material has been found to illustrate this process, and at the same time to afford irrefutable proof of the identity of the forefathers of the most important cereals, wheat and barley. The latter problem has been discussed endlessly, particularly in the



Carbonized wheat grains from Jarmo.

light of modern experimental genetics, but here at last, in the actual plants of the remote past, we have found tangible evidence.

In Jarmo we found exactly what would be expected in a very early type of village-farming community. In preceramic levels, amidst primitive architecture and artifacts, imprints of wheat and barley were encountered, as well as carbonized grains of both species. These bear the closest similarity to the wild prototypes which we have ever seen. From the imprints we gather that the wheat



The cultivated wheat species and their progenitors.

spikelets differed very greatly, some of them being coarse and vigorously hirsute like the wild Emmer, others approaching the typical cultivated cereal. We seem to have come upon a stage where mutations are in evidence together with the progenitor, and this cannot be very far from the time of the first domestication. To account for the presence of the wild-wheat type we must assume that slow and careful reaping must still have been practised. Since the two wild wheat species do not occur as field weeds, their presence among the grain indicates that they were the actual parent stock.

The carbonized wheat found at Jarmo comprises two types of grains, one with a flat ventral side, corresponding to the long slender grain of the wild Emmer, and another with a convexly curved ventral side which is identical with the wild Einkorn. Thus we know that the two species, which still grow together in the Kurdish mountains, were domesticated together.

These two wheat species remained in cultivation in this area for several thousand years, Emmer as the more important. When, however, they spread with migrations in many directions, Einkorn reached the limit of its adaptational power in the alluvial plains to the south. Emmer was the staple wheat species both in fifth millennium Lower Mesopotamia and in Egypt, while Einkorn has not been found in these two areas. On the other hand, Einkorn seems to have met with optimum conditions in mountainous Cilicia, in southeast Anatolia, where we find the most splendidly developed prehistoric grains of this species. Both species were carried into Europe, principally through the Danube Basin, and they arrived together in northern Europe during the first half of the third millennium B.C.

WILD AND CULTIVATED EINKORN AND EMMER are called "glume wheats" because their kernels are stuck so tightly between the glumes, or husks, that they are not released by normal threshing. The other category is described as the "naked wheats" because the kernels are easily released from the husks by threshing. There are two genetically different groups of naked wheats, one of which has twenty-eight chromosomes. This is the tetraploid group, comprising, for instance, Hard wheat and Rivet wheat. The other, the hexaploid group, with forty-two chromosomes, comprises Bread wheat and Club wheat.

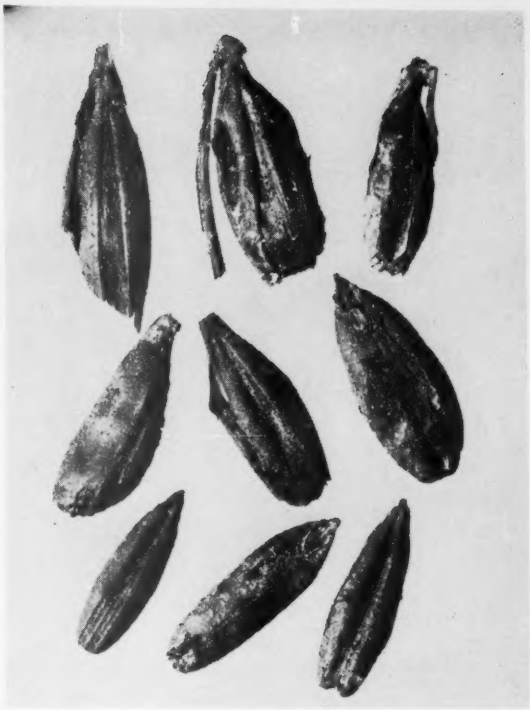
The collected material does not account for the emergence of the naked wheats. It is believed that the tetraploid group could have resulted from interbreeding

between extreme varieties of Emmer, but the hexaploid group is considered to be formed of hybrids of Emmer with some other grass (Aegilops has been suggested). Indeed it is undisputed that Emmer is the progenitor of both groups.

If it is a fact that Aegilops played a parent rôle to the naked Bread or Club wheat, it follows that the species must have its origin in the Near East, where Aegilops grows as a weed in the cornfields. It is, however, peculiar that Bread wheat is hardly known from any Near Eastern finds earlier than those of Central Europe. In my opinion, the hexaploid wheat emerged sporadically from the very beginning of agriculture, but as a freak that had no stamina. Transported as a weed with Emmer and Einkorn, it eventually reached different environments where it flourished, mutated, and created types adapted to the new surroundings. While this process was abortive in Egypt—the cereal is absent from Dynastic grain deposits—in Switzerland the development is strikingly illustrated. In Michelsberg culture deposits (late third millennium B.C.) a whole group of morphologically different types occurs, among which the first palaeoethnobotanist, Oswald Heer, distinguished two varieties, one of which is still in existence. After that time the species is found almost everywhere in Europe, but in most places except Switzerland it seems to have been second to Emmer.

In Iraq the Bread wheat type occurs sporadically from about the middle of the third millennium, but only in the foothill country, not on the irrigated plain. There is a grain deposit from about 2000 B.C. or a little later in Bazmosian, near the Persian border of Iraqi Kurdistan, which consists largely of Bread wheat, and shows definite cultivation of the species. By this time a variety had developed that was able to endure the ecological conditions of Kurdistan, but its early development probably occurred elsewhere.

We know that in the course of the second millennium Bread wheat was an important cereal in several places in Asia Minor, Syria and Palestine. Even today the hexaploid naked wheat is found in the Near East, but it is of negligible importance compared with the tetraploid group. We do not know when the change from hexaploid to tetraploid occurred, but in Egypt the earliest finds of Hard wheat may be dated to the time of the Ptolemies. Thus it seems that Bread wheat exercised only limited influence on the fate of Emmer in the Near East and that the tetraploid species of naked wheat became preeminent



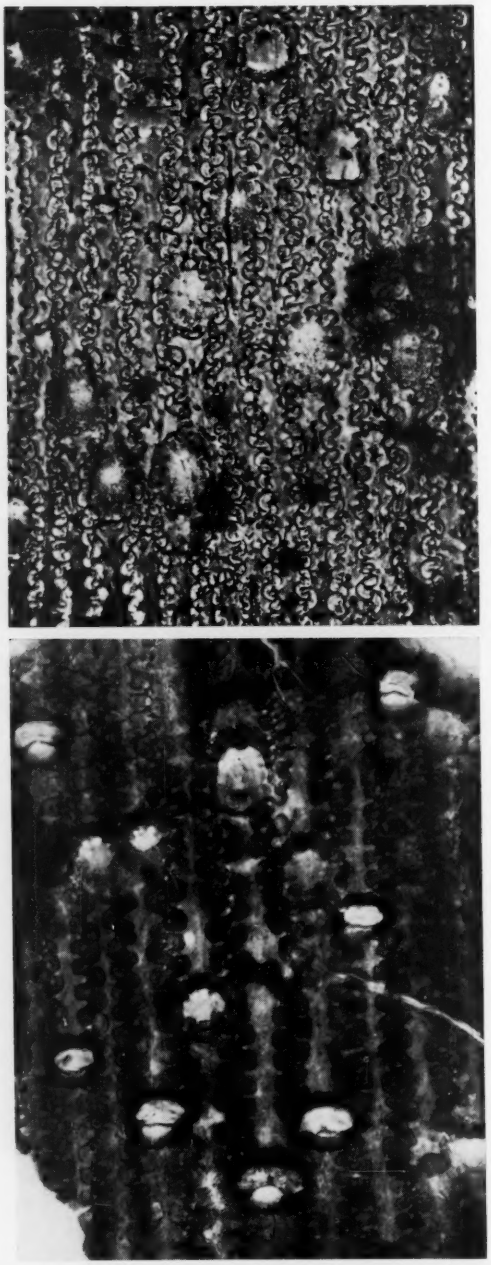
Two-row barley grains, carbonized, from Jarmo.

both in the mountainous areas and in the lowlands.

Although Bread wheat was crowded out from the Near East, this species increased in importance in Europe, and replaced Emmer in most places during the first half of the first millennium A.D. It also found suitable conditions in Central Asia. The wheats of Afghanistan are still principally hexaploid, forming a most varied group of morphological types parallel to those of the tetraploid Naked species in western Asia and northern East Africa.

BUT LET US RETURN to Jarmo. Profuse evidence of barley was found there, both imprints and carbonized grain. Only one type can be identified, and this corresponds closely to the modern wild barley of the district. Like the latter, it has a long, slender two-row spike, hairy but no longer brittle. There are examples of spike sections with the lateral rudimentary florets and parts of the internodes attached to the fertile median floret. Pieces of the axis occur, consisting of two or three internodes, and this definitely shows domestication, as the wild spike falls to pieces when dried, even if not completely mature.

In its native districts the wild barley grows practically everywhere. It occurs abundantly from sea level to some



Even ash and carbon detritus may yield an exact basis for identification. *Top:* silica skeleton from wheat ash, showing the specific cells of the interior husk epidermis; *bottom:* the same tissue from carbonized barley. (475 diameters.)

six thousand feet above. I have never seen a field of any crop in Kurdistan without stray individuals of this species growing as weeds. This must have happened from the very beginning of the cultivation of wheat, and with or without human intervention barley was drawn into the domestication process by means of the automatic selection of the tough-spike individuals.

For a long time the two-row form of barley was the only one grown in Kurdistan, and even today it is the principal type found in these uplands. When, in the fifth millennium, agriculture invaded the alluvium of Mesopotamia and Egypt, two-row barley disappeared. The species has been postulated for the Fayum in Egypt, but the evidence is not unquestionable. Among some two thousand imprints from prehistoric and early historic lower Iraq I found abundant evidence of the lax-eared, six-row barley, but not one imprint of a two-row spike or any other sign of the existence of this form until the ninth century A.D., by which time the Arabs had brought about the interchange of plants within the huge area under their domination.

The emergence of six-row barley has been under discussion for a long time. Many theories have been offered, all founded upon the assumption that the earliest cultivated barley was the six-row type. This premise seemed valid enough, since all ancient barley found both in Egypt and in Switzerland was demonstrably six-row. But now we are able to show evidence of two-row barley cultivated much earlier and, furthermore, within the distributional area of the only possible progenitor. Also, we are able to demonstrate that the six-row form replaced the two-row as soon as agriculture moved into the alluvial plains. It is logical to conclude that this forcible change of ecology imposed upon barley brought about the mutation which resulted in the six-row species. That a natural qualification for this mutation exists is borne out by modern experiments, which have produced a transition from two-row to six-row spikes in response to certain physical treatment.

During subsequent times endless interbreeding has created varieties of almost every conceivable morphological composition and adapted to the most varying ecological conditions. The Naked form of barley did not emerge on the hilly flanks of the Fertile Crescent and was never grown there. It appears in the southern part of Central Anatolia at the beginning of the second millennium B.C., and in Europe it occurs from the beginning of agriculture. Evidently it emerged there independently of similar

Field peas, carbonized, from Jarmo. This plant grows wild in Kurdistan, and the early farmers at Jarmo seem to have grown it together with the grain.

Pistachio nuts, carbonized, found at Jarmo. These nuts were collected from wild trees. Their oleaginous seeds formed a supplement to the farinaceous food.

mutations which took place at some unknown—but presumably much later—time in Central Asia and Abyssinia.

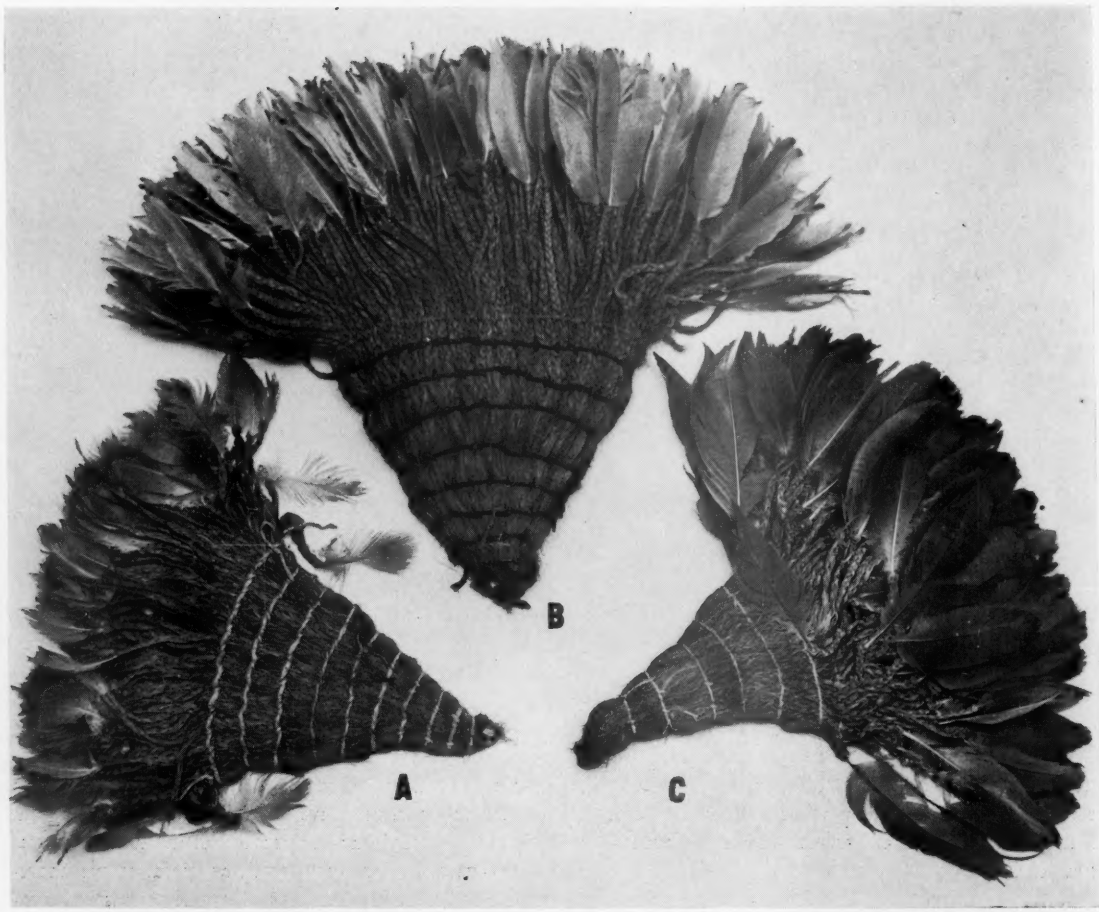
In six-row barley two main forms are distinguished, one with long nodding spike (lax) caused by long internodes; another with a short erect spike (dense) with short internodes (see diagram on page 183). The dense-spike form was created by ecological conditions, probably in severe mountainous environment. Whether it came about as a mutative development in the lax-eared form, or emerged directly from the two-row species, we cannot say for certain. A special anatomical feature suggests the latter possibility. Dense-spike barley was found at Mersin, in southeast Anatolia, on the coast. Although the Neolithic date ascribed to it is unspecified, it must be fairly early. The same form occurs intrusively in the Khabur area of eastern Syria, in the third millennium B.C., probably introduced from Cilicia. It appears at the beginning of European agriculture in mountainous Central Europe, but not on the northern and western fringes of that continent. In Mesopotamia it does not occur at all in alluvial agriculture; several authorities claim it is found in Egypt.

TO SUMMARIZE, the evidence shows that the hilly flanks area is the natural habitat of both of the only possible progenitors of cultivated wheat and barley, and consequently the first domestication must have taken place there. It seems logical to suppose that wheat was cultivated first and that barley, originally a weed in the wheat field, was later drawn into domestication. Contrary to the prevailing concept, two-row barley is the earliest of all cultivated barleys, while the six-row forms emerged as mutations.

The early history of cultivated plants is a most important problem, intimately allied with the history of man. Therefore it is a source of serious concern that so much grain is being squandered needlessly in the ovens of the Carbon 14 laboratories. In most cases, where carbonized grain is found, carbonized wood is also available. Then why sacrifice the grain? It is a serious menace to palaeoethnobotany that this scientifically valuable material is selected for destruction. No doubt much information has already gone down the drain. I know from personal experience of several interesting grain finds being sent for Carbon 14 analysis, and only incidentally was a tablespoonful preserved for the botanist to study. If no palaeoethnobotanist is available at the moment, the grain should be stored and entered in the inventory of excavated material. Some day it will be useful to our understanding of the broader issues. To destroy it is inexcusable. As archaeologists come to realize the value to themselves of cooperation with palaeoethnobotanists, understanding of the history and distribution of food plants is bound to increase.

Three Feather Ornaments from Peru

by Ina VanStan



Three pre-Columbian feather ornaments from Peru. The largest measures eleven inches from the point of the base to the tips of the feathers. These well preserved examples present one of the many ways in which bright-colored bird feathers were used for human adornment. The feathers, which are orange in two of the ornaments (**A** and **B**) and blue in the third (**C**), probably were obtained in the tropical rain forest east of the Andes, although all evidence indicates that they were made into ornaments and used by the inhabitants of the arid southern coastal region of Peru.

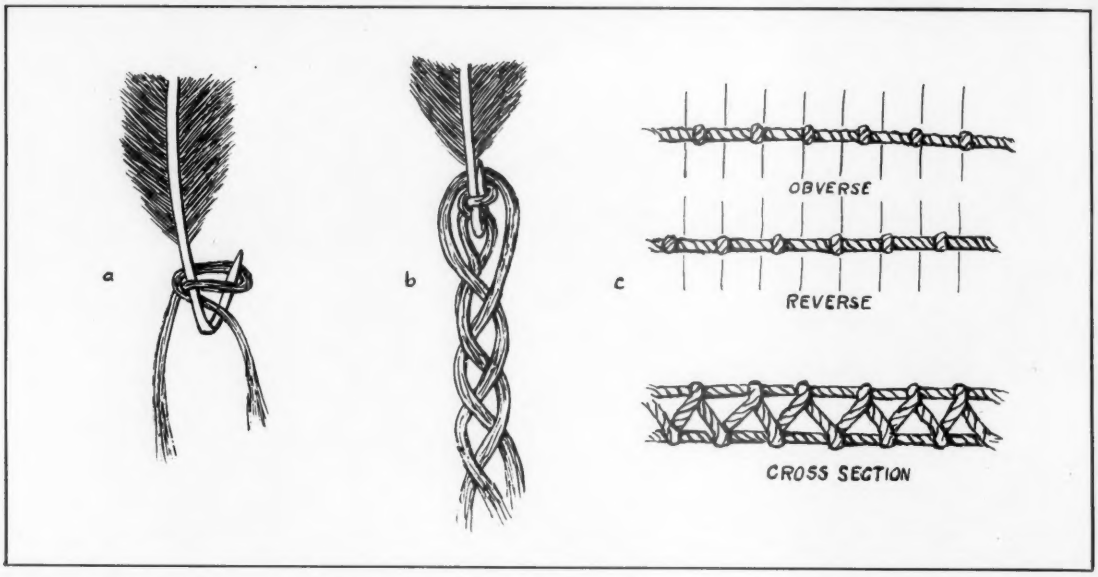
One of the Peruvian feather ornaments **(C)** shown in the illustration on the opposite page. This is believed to have been a part of a man's headdress and to have been in use some six or seven centuries before the Spaniards set foot in Peru.

THE DECORATIVE VALUE of bird feathers, especially those of vivid hues, has received wide recognition. The practice of using feathers to enhance various types of distinctive wearing apparel, headdresses and ceremonial regalia has had both a broad distribution and a considerable artistic development. Probably the oldest surviving examples of American feather art are those which have come from the pre-Columbian cemeteries of Peru. Among the Peruvian feather objects which have been preserved are several types of fan-like ornaments. Although not thought of as textiles, most of them are made of textile fibers as well as feathers and have been constructed by means of simple braiding, or plaiting, and sewing processes. The method of fabrication of the different types varies somewhat, but in general they follow a simple pattern in which a number of small stem-like structures, each surmounted by a single brilliant-hued feather, are gathered together to form a triangular base. The three specimens illustrated in this article probably came from the south coastal region of Peru and are believed to have been made between A.D. 800 and 900.* All are of a single type.

The materials used—feathers, unspun bast (stem or leaf) fibers and coarse cotton yarns—are all in their natural colors, neither bleached nor dyed. The feathers are orange and blue parrot feathers,* the dark buff-color fibers are probably agave or some closely related plant; and the yarn, natural brown and light cream-color cotton. All of the feathers chosen are flight feathers, and those selected for each ornament are approximately equal in length and alike in coloring, chiefly orange in **A** and **B**, and blue in **C**. **A** is somewhat brighter than **B**, and **C** shows a little yellow on the under sides of the feathers, near the quills. The coarse cotton yarns are similar to modern soft cotton string. The yarns used in the largest feather ornament **(B)** are brown, while those in the other two **(A** and **C)** are almost white. All are multiple-ply yarns, differing slightly from one another. The brown is five-ply, Z-spun, hard-twist and about one-eighth of an inch in diameter, each ply being S-spun and crepe-twisted.

An analysis reveals that in each of the examples illustrated the quill end of a feather shaft was anchored at the starting point of a simple three-strand braid, which was made of unspun bast fibers (see the figure on page

* In the registration inscription issued as identification, for purposes of exportation and customs clearance, by the Museo Nacional de Arqueologia, Lima, Peru, September 27, 1943, these feather ornaments have been classified as *"Adorno de fibras y plumas de loro en forma de papacho, para los hombres. Nazca."*



Diagrams of the processes used in the construction of the feather ornaments. a. Attaching the feathers. b. Making the braids which served as "stems" for the feathers. c. Double couching stitches, which were used to bind the braid ends together and produce the base part of the ornament.

Three Feather Ornaments continued

192, **a, b**). A considerable number of these tiny individual braids was prepared. Each braid was quite flat, about one-eighth of an inch in width and four inches long. The braiding was sufficiently compact to make each stem-like section slightly stiff so that it would hold its feather more or less upright but not rigidly so. Unplaited ends of the fiber strands, about four and one-half inches in length, extend beyond each braided section.

The desired number of these little braids—224 in **B**, the largest ornament—were placed in a row side by side, with the tips of the feathers even. The braids were then strung together on a coarse cotton yarn at a distance of two to two and three-fourths inches from the base of each feather. The "fabric", which was obtained by keeping all the braids flat, parallel and adjacent to each other, was folded to obtain two, three or four thicknesses: ornament **A** has two, **B** has four, and **C** has three thicknesses. The layers of braids then were sewed in place by means of a row of double couching stitches (see **c** on the drawing) which were placed a little below the stringing thread. The sewing was done with the same cotton yarn used for stringing the braids together. The stitches were about half an inch long and were pulled up tightly enough to produce a strong, firm binding.

Next, the unbraided ends of the fibers, which had been straightened to lie smooth and parallel, were gathered together neatly to form the apex of the fan-like base of the ornament. These ends were fastened together securely by means of sewing, and six or seven evenly spaced rows of couching stitches were added between the apex of the triangular section and the original band of couching.

A RECONSTRUCTION of the method used in attaching the feathers to the braids indicates that a bundle of parallel fiber strands was prepared, which was seventeen to eighteen inches in length, and in bulk half that of the desired braid size. This bunch of fibers was divided into two strands, one of which was half the thickness of the other. The thinner strand was doubled end to end, to form a loop near its midpoint, and a feather quill, turned back about one-fourth of an inch from its tip, was hooked through this loop. One end of the fiber strand, after being passed around the quill to secure it firmly, was doubled back against its other half, with the ends together, to produce the first strand for the braid. The larger bunch of fibers was then placed with its midpoint behind the quill tip, slightly above the fiber binding. One end was carried to the front and over the first strand, to become the second strand of the braid; the opposite

end, which formed strand three, was brought to the front, then over strand two and under strand one. Braiding continued from this point as in any simple three-strand braid.

The stringing together of the braids involved only the threading of the coarse yarn into a needle, which was pushed through each braid from edge to edge, the thread following the path of the needle, as in modern sewing. There seems to be no doubt concerning this process, since eyed needles are known to have been in use, and the path of the thread lies through each braid, splitting the various strands rather than passing between them.

With the stringing thread holding the braids in sequence, the whole assemblage was folded together carefully, feathers against feathers, braids against braids, and all the free fiber ends neatly parallel. A single row of couching stitches was introduced to secure the folds and to hold the braids in their established sequence. This row of sewing, which was inserted in a straight line parallel to the stringing thread, became an arc when the free ends of the fibers were drawn together to form the base of the ornament. The subsequent rows of couching stitches were added parallel to this slightly curving line.

All the sewing is of an embroidery type. Although not highly decorative, it has an ornamental as well as a functional purpose. That the ancient Peruvian craftsmen who produced these feather ornaments considered the latter more important than the former is attested by the lack of care evident in the irregular placement of the rows of couching and the differing angles of the individual binding stitches, and also by the fact that in no case has the sturdiness of the construction been reduced by this failure to meet high standards of decorative stitchery. It is difficult, even when using a modern steel needle, to produce first-class double couching stitches. Since the active sewing yarn moves forward while it passes through the thickness of the folded fabric from one face to the other, there is a strong tendency for the stitches to cross the floating yarns at angles other than right angles. It is equally difficult to space the stitches evenly when they alternate from one face of an opaque fabric to the other, and the difficulty increases directly with the thickness through which the needle must pass (c in figure on opposite page). That none of these niceties of detail was beyond the skill of Peruvian craftsmen is demonstrated by the many surviving examples of exquisite needlework. Therefore the emphasis on sturdiness must have been a matter of choice rather than necessity.

The durability of the construction is, in fact, remarkable. Feather quills have been broken, but no instance has been located in which a quill has slipped from the knot holding it to a braid. Only at the apex section of the base, which shows evidence of having been a point of attachment, is there any indication of the sewing having loosened. Not only the construction, but the materials and colors as well are in an excellent state of preservation.

NO SPECIFIC INFORMATION is available regarding these ornaments, which are now in the Carter Collection of the Florida State University. The registration inscription of the Museo Nacional de Arqueologia of Lima (footnote, page 191), issued at the time of exportation, classes them as Nazca, which would indicate a southern coastal, Early Period affiliation according to Bennett's classification ("The Archaeology of the Central Andes," in *The Handbook of South American Indians,* Vol. 2, Bulletin 143, U.S. Bureau of American Ethnology [1946] 75, 80, 92-95). Unfortunately, the basis for the description was not mentioned, and it is uncertain whether the term Nazca was intended to designate the specific time and/or place of origin of these particular feather ornaments or merely to classify them as belonging to the art style which was developed in the Nazca region during the Early Period. The only published example of Peruvian feather work which appears to be identical with these (Gösta Montell, *Dress and Ornaments in Ancient Peru* [1929] 53-54, fig. 18) has been classed as Ica, which would tend to confirm the southern regional affiliation but indicate a slightly later date.

These ornaments differ considerably from the Paracas type known as "ceremonial fans" (Rebeca Carrión Cachot, *Paracas: Cultural Elements,* Lima [1949] plate XXII). Little is known concerning their use, but they are believed to have been worn attached to the headdress. Despite the apparent rarity of examples of this specific type and the simplicity of construction, the unwavering consistency in the method of attaching the feathers and starting the braids, together with the uniformity of braid size and the smoothness and evenness of the braiding, shows the work of a practiced hand. This indicates the presence of a well established pattern of procedure and suggests a broader use for these feather ornaments than that disclosed by the meager number of examples which have been reported.

THE AUTHOR, who holds a B.A. and M.A. from the University of California, Berkeley, has been since 1941 Professor of Textiles and Clothing at Florida State University. Her chief research interest is in Peruvian textiles. She has published a number of articles and a monograph, *Problems in Pre-Columbian Textile Classification.*

The Cemetery of Son Real, Mallorca

View of part of the necropolis of Son Real, looking inland. At right center may be seen a fine example of the well constructed apsidal tombs of Type 1. The lack of fixed orientation of the tombs is very clear.

By MIGUEL TARRADELL, University of Valencia, and
DANIEL E. WOODS, Manhattanville College, Purchase, New York

Map of the island of Mallorca. Son Real lies on the bay of Alcudia, in the northeastern part of the island.

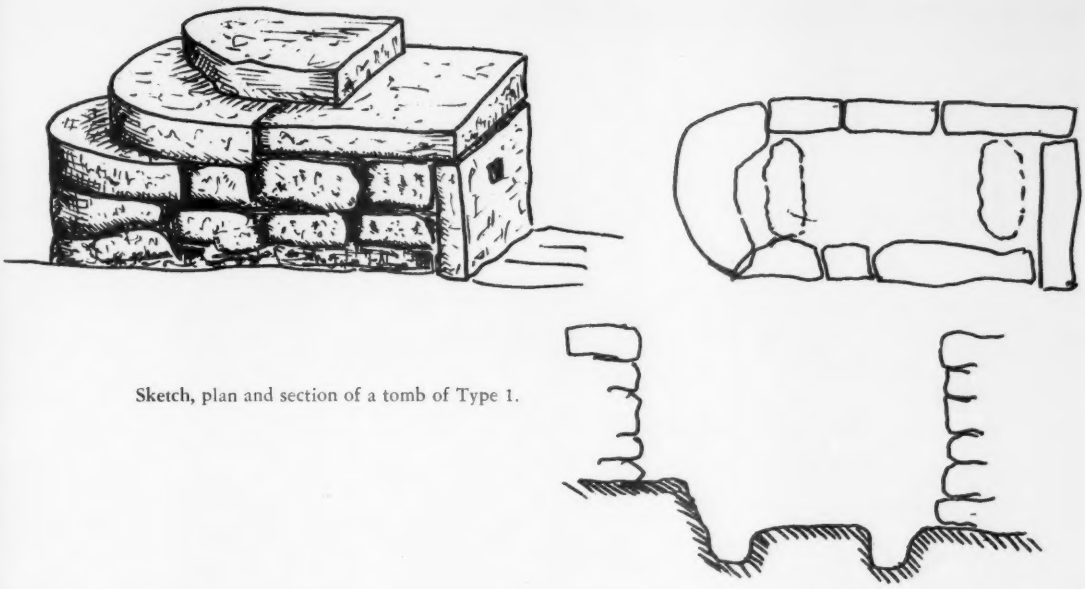
THE BAY OF ALCUDIA, facing northeast, occupies an important part of the northern coast of Mallorca, the largest of the Balearic Islands. Possessed of an excellent beach, its shore is rich in the remains of the prehistoric Talayotic culture. This name, derived from the Spanish word *talaya,* or watchtower, refers to the square or round towers of cyclopean masonry associated with the Bronze and Iron Ages of Mallorca and Menorca. In the center of this bay, on a rocky tongue of land about a mile and a half southeast of the modern village of Ca'n Picafort, are the remains of an ancient necropolis, Son Real, named for the estate on which it is found. The necropolis has been known for some time to the inhabitants of the region, who called it "the cemetery of the Phoenicians." Although known to local residents interested in archaeology, it remained unexplored until our excavations of 1957 and 1958. Some of the tombs have been plundered, for the most part during recent decades, but their number is not enough to prevent systematic and fruitful excavation.

Sixty-three of the tombs of Son Real have been studied. These apparently comprise the larger part of the cemetery, but there are still more tombs, and indeed the exact limits of the site cannot be determined without further excavation. The objects found in the tombs have been taken to the Municipal Archaeological Museum of Alcudia, fifteen miles away. Since the finds have not yet been studied in detail, this article is limited to a general description of the tombs and the objects in them, without attempting to solve the problems which they present. Nevertheless, a general description at this stage is worth while because Son Real is a site of exceptional importance, unique on the Balearic Islands.

The necropolis occupies a relatively small space, considering the number of the tombs and their size. As may be seen from the illustrations, the tombs are crowded close together. Sometimes there is space between them, but in most cases this intervening space was appropriated by later inhabitants of the area, who used the sides of the earlier tombs as part of their own mortuary chambers. The tombs do not have a fixed orientation. On the basis of form and construction they may be divided into

Another view of the crowded tombs at Son Real, showing clearly the location of the cemetery on a rocky spit of land. In the foreground may be observed the method of building the corbeled roof of one of the circular (Type 4) tombs.

THE AUTHORS of this article have been engaged for several seasons with a varying group of colleagues in excavating Roman and pre-Roman sites on the mainland of Spain south of Valencia and on the island of Mallorca, as reported in ARCHAEOLOGY 11 (1958) 282. The excavations, which have continued this past summer, have been sponsored by the William L. Bryant Foundation of Springfield, Vermont, under the auspices of the Spanish Archaeological Commission. Both the Roman town of Pollentia, at Alcudia, and the necropolis of Son Real have proved to be important sites. Pollentia has five levels of Roman occupation, from its founding, ca. 125 B.C., up to its destruction in the fourth century A.D., and evidence of an earlier occupation which, on the basis of ceramic remains, seems associated with the "Talayotic" culture on the island. Because of the unique importance of the pre-Roman necropolis of Son Real for the earlier history of the Balearic Islands, this article is devoted to a description of its tombs and the rather sparse but important grave goods found in them.



Sketch, plan and section of a tomb of Type 1.

SON REAL continued

four types, which will be here described in general terms.

Type 1. These tombs are rectangular and apsidal, i.e., with one end rounded. The walls are of ashlar masonry, well worked and laid dry, the stones being generally of large dimensions. In some cases the better worked stones are limited to the upper part of the structure. The covering of these tombs is formed either of large flat slabs or of well worked large stones. In general the tombs of Type 1 are about three meters long, two meters wide and one meter high. They are built directly on bedrock. Their distinctive feature is two parallel shallow trenches dug out of the rock floor, at right angles to their long sides, one being near the apsidal end and the other near the opposite end. The trenches are for the most part roughly rectangular in shape, although they may form irregular ovals, and in one tomb they are circular. Twenty of the sixty-three tombs explored are of this type—or about one-third of the total. There are also three other tombs of the same shape which do not have the two trenches inside.

Some Type 1 tombs have another peculiar feature—small window-like apertures, measuring from 8 cm. x 10 cm. to 10 cm. x 17 cm., in the upper part of the wall opposite the apsidal end. These openings, which vary from one to three in number, are cut into the stone. Where there are two or three apertures, they are all on the same level, though they may be cut to different depths.

Most of these tombs contained one or two skeletons, some as many as five or six. Thus they may be either individual or family tombs. The position of the skeletons is always the same. They are found in the center of the tomb, between the two trenches, lying on the bedrock, in a contracted position with the head toward the end opposite the apse and the feet drawn up so that the knees almost touch the chin. In some cases the head, which usually looks east, is propped on a stone slab. Contrary to what might be apparent at first sight, the trenches never contained the corpses, and only rarely grave furnishings.

Type 2. This is similar to Type 1 but does not have an apsidal end and is constructed with less care. The plan is rectangular; the walls are made of good ashlar masonry. In some instances the double trenches are found on the bottom, as in Type 1; in other cases the floor is plain. Several of the tombs have only one trench on the floor. One exceptional tomb is square in plan and has both the double trenches and two "windows" of the sort found in some Type 1 tombs. In general, the tombs of Type 2 are smaller than those of Type 1. Sixteen of the total number excavated are classified as Type 2. It would seem from the arrangement of the necropolis that these tombs are somewhat later than those of Type 1.

Type 3. The tombs of this type are also rectangular, but they differ from those already mentioned in the poor

A group of closely packed tombs, showing the massive blocks of stone used in their construction. At the rear is an apsidal tomb with three "windows" in the end opposite the apse.

A closer view of the apsidal tomb with three window-like apertures. They are cut into a single large block of stone which forms the end wall of the tomb.

Interior of a rectangular tomb with two trenches cut into the bedrock which forms the floor of the tomb.

SON REAL continued

quality of their construction, with coarse walls made of irregular stones. These tombs are smaller and lower, but they may have been partially destroyed, which would make their original height uncertain. Several of these tombs were built on sand, not on bedrock as all tombs of Types 1 and 2 were. For this reason they are less well preserved. In none of them can the method of covering be ascertained, since no remains of their roofs have survived. Seven tombs of Type 3 have been excavated.

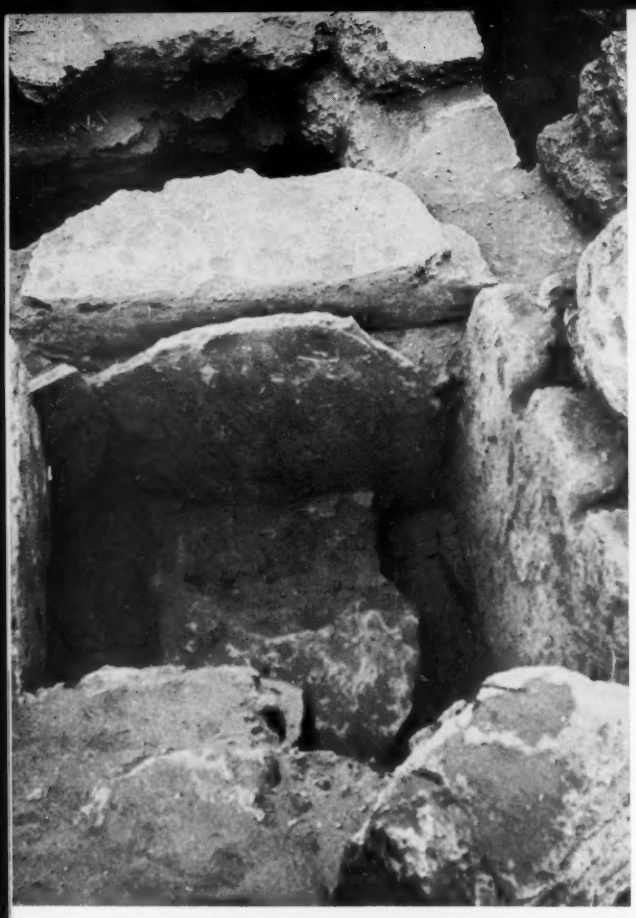
These tombs occupy the southeast sector of the necropolis, giving the impression that they form a late prolongation of the original cemetery. This impression is confirmed by the fact that there are signs of cremation and the furnishings appear to be of a later date. The sand in the central part of the tombs is black in color, evidently transformed by the effects of fire, and the bones which remain are found in a disordered state.

Type 4. The tombs of this type are circular in plan; they are constructed of large irregular stones, those in the upper layers being as a rule better worked. The covering of this type consists of very large slabs recalling the false-vault cupola dome. The corbeling, however, is very slight, and the dome extremely shallow. The all-over diameter is three meters. Only four tombs of this type have been excavated; in three of them multiple burials were found, one containing fifteen individuals. On the other hand, one tomb had only two skeletons, one above the other, with the lower skeleton in a trench dug out of the rock. The deceased were always found in a contracted position, as in the tombs of Types 1 and 2.

Although the number of Type 4 tombs excavated was only about seven percent of the total, there were other circular tombs at the site; one had been destroyed by the sea, and others, which had been ransacked, lay just beyond the portion of the cemetery uncovered during our campaigns. On the whole, however, it is clear that this type occurs less frequently than the other three types.

IN CONTRAST with the careful construction of the tombs, which on the whole is quite impressive, the material within the tombs was found to be comparatively scanty. This scarcity must not be attributed to destruction of the tombs or to plundering, as many of them were found untouched, but rather to the peculiarities of the specific funeral rites practiced here. Many tombs contained no furnishings whatever.

The objects found most frequently were bones carved in the form of cork bottle-stoppers. These appeared mostly in tombs of Types 1 and 4, less often in those of Type 2. Sometimes only one of these carved bones was found in a tomb, sometimes several. Their use or sig-



This exceptional tomb of Type 2 is square and has double trenches in the floor as well as two apertures in one wall.

SON REAL continued

nificance is still unknown. Similar carved pieces of bone are, however, known from other sites, including some in the area of Talayotic culture.

As for pottery, small fragments of a ceramic type related to this culture have been found in several of the tombs, but in some cases these fragments may have been introduced into the tombs with sand that filtered in. It is quite clear that normally the depositing of vases in the tomb did not play a large part in the funeral rites here. Only in five burials have complete vases been found. These belong to a type already known: they are handmade, unglazed, conical in shape and with a wavy edge and handles that have sharp points towards the top.

Metal objects in the tombs, as well as the worked bones

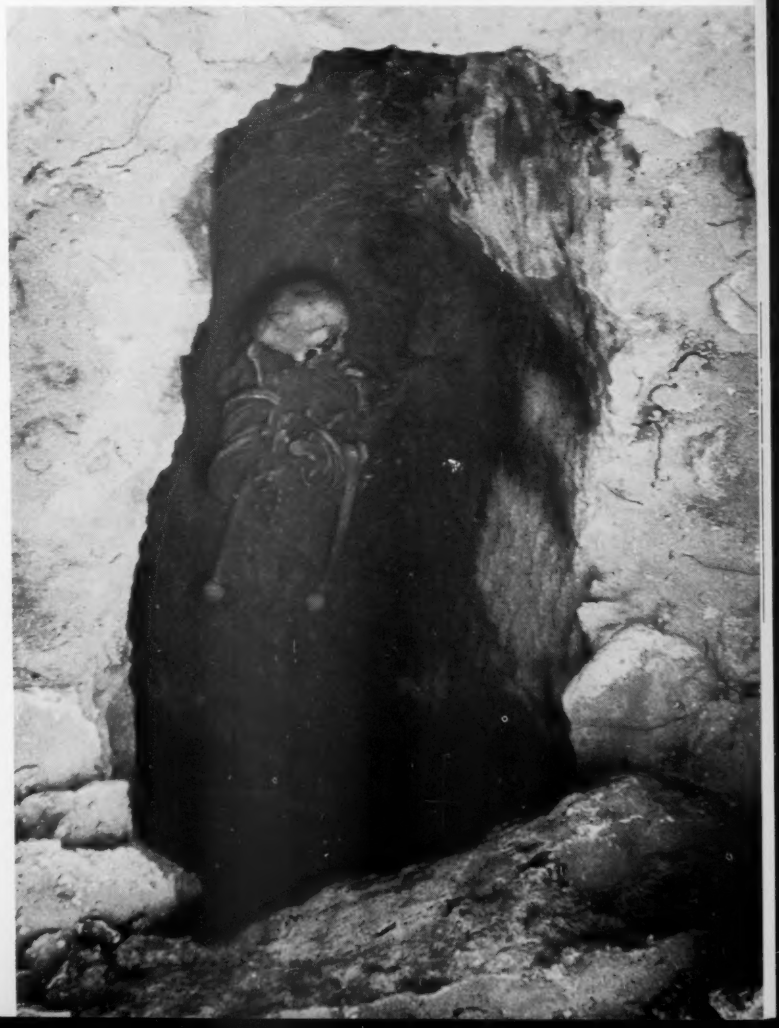
Reconstruction of a Type 1 tomb, showing two apertures cut into the top of the slab which forms the end, and the large slabs used for the covering.

and the pottery, would seem to be another link in the chain binding this necropolis to the Talayotic culture. Both bronze and iron objects were found together in the presumably earliest tombs. The bronze objects include: a razor, which is slightly rounded, with a semicircular opening in the upper part and a square handle, two chisels, a tubular axe with a lug, and four lance points with wings very much reduced. With the exception of the axe, which was found in a tomb built to utilize the space between two earlier tombs, all the bronze objects came from tombs of Types 1 and 2, which are presumably the oldest—seventh or sixth century B.C.

Iron is abundantly represented at Son Real, appearing in tombs of all types, which proves that even during the period when the earliest of the tombs were constructed, this metal was already in current use in Mallorca. Unfortunately the iron objects, as is usually the case, were found in a poor state of preservation and consist for the most part of reduced and shapeless fragments. Among the better preserved pieces are: a sword or dagger handle with antennae (a type dated in Iron Age II, about 450 B.C. in Spain), a curved sword blade, and remains of blades of knives, swords or lances. The two most easily identifiable pieces, the sword handle with antennae and the curved sword, were found in rectangular tombs belonging to Type 2.

Finally, many beads have been found among the tomb furnishings, mostly in those of Type 3 tombs, which are

An example of the contracted burials found in the earlier tombs of Son Real.



Left: **Bronze tubular (socketed) axe** with lug for thong which was used to hold the axe head and handle firmly together. This was found in one of the later, improvised tombs which made use of the walls of earlier ones. *Center:* An iron sword handle with antennae, found in a tomb of Type 2. *Right:* Some of the blue glass beads which were found in Type 3 tombs, dated fourth-third centuries B.C.

SON REAL continued

probably later than the other three types. In one instance some beads were found in a tomb of Type 2, and once in a Type 1 tomb. The beads are made of glass paste and are evidently a product of Punic commerce. In this connection the proximity of a large Carthaginian center on the nearby island of Ibiza should not be forgotten.

The real surprise in relating the necropolis of Son Real to the Talayotic culture is the method of burial. For all the previously known Talayotic burials—and there are many—have been in hollowed out caves of large dimensions. In this the people were following a tradition already old in the country, with only some modification in detail. Here at Son Real our first impression after excavation began was that we were confronted with a site far removed, both in time and in cultural relations, from the Talayotic. This hypothesis must now be abandoned, in spite of the series of problems which it presents and which we cannot elaborate upon at this time. It may be mentioned, however, that in shape the tombs of Type 1 bear certain resemblances to the "Navetas" of Menorca, which are much larger and may also be burial chambers.

IN SUMMARY, the work at Son Real presents:

1) The discovery of a new type of necropolis, new not only in the Balearic Islands but also in the Western Mediterranean area.

2) New evidence for a more complete understanding of the so-called Talayotic culture, a culture which apparently developed in the area and which shows more variations than had been previously observed elsewhere.

3) Additional knowledge about the metals used by the people of this culture. For although all the types of metal objects found at Son Real were already known in Mallorca and Menorca, the previous finds were for the most part the result of chance and therefore could not be fitted into a systematic grouping.

4) Important material for the study of the people themselves—a series of skeletons, many complete, and more than a hundred crania in a good state of preservation are being studied in Barcelona. This constitutes a novelty for the study of Balearic prehistory.

Finally we must say a few words about the chronology of the necropolis, although this is a problem which can only be solved on the basis of studying comparable objects found at other sites. In our judgment, we have pointed out three periods: the oldest is represented by the tombs of Types 1 and 4, that is, the apsidal and circular tombs. Very close to these, and perhaps as a continuation, we would place the rectangular tombs designated as Type 2. This would indicate the normal use of the cemetery *in continuum*. There remains the problem of ascertaining whether the tombs of Type 3, with incineration, were also used *in continuum* or, as may well be, represent an interruption in the cultural pattern. In any event there is no doubt that some of the tombs were re-used sporadically during the Roman period. The time of greatest use of the necropolis would seem to fall between the seventh and the fifth or fourth century B.C.

ARCHAEOLOGICAL NEWS

Fellowships for 1959-1960

Several institutions and foundations have awarded fellowships to scholars in archaeology and related studies. In the last issue we listed the recipients of the Rome Prize fellowships in Classical studies. Other awards are as follows:

The American Association of University Women has granted four fellowships to women in archaeological and closely related fields.

JOAN MARIE FAGERLIE's research will seek the explanation for hoards of Byzantine coins found in Scandinavia, dating from A.D. 395 to 565. This carries on her earlier work.

JOAN E. FREEMAN, who worked in a related area last year, will make a study of culture change from a Caddoan type to a Plains-like culture in northeastern Oklahoma.

ANN KONRAD KNUDSEN is beginning a survey to determine the influence of metallic vessel types and metal ornaments on clay vases of early Greece.

JEANNY ESTHER VORYS will continue her study of Hittite bronze figurines, especially their relation to similar figurines from North Syria and Palestine.

The American Research Center in Egypt has appointed two Fellows for research in Egypt, thanks to a grant by the Bollingen Foundation.

NICHOLAS B. MILLET has been appointed Fellow in Egyptology.

GEORGE T. SCANLON has been granted the Fellowship in Islamic Studies.

The John Simon Guggenheim Memorial Foundation has awarded fellowships in ancient studies and archaeology to the following:

ELIAS J. BICKERMAN, Columbia University. Studies in the history of the late Roman Empire.

LIONEL CASSON, New York University. The history of maritime commerce in Hellenistic and Roman times

LLOYD WILLIAM DALY, University of Pennsylvania. The origin and history of alphabetization in antiquity and the Middle Ages.

STERLING DOW, Harvard University. Studies of Greece in antiquity.

THEODOR HERZL GASTER, Dropsie College. Studies of the religious communities of the Samaritans.

ROBERT MCQUEEN GRANT, University of Chicago. The early history of the Christian Church.

RICHARD CASPER RUDOLPH, University of California, Los Angeles. A study of Chinese archaeology from early to modern times.

DORIS MAE TAYLOR, Wheaton College, Norton, Massachusetts. Trade in the Western Mediterranean in the second century B.C.

LILY ROSS TAYLOR, Bryn Mawr College. Roman politics in the last two centuries of the Republic, 220-44 B.C.

Annual Meeting of the ARCHAEOLOGICAL INSTITUTE OF AMERICA

The sixty-first General Meeting of the ARCHAEOLOGICAL INSTITUTE OF AMERICA will be held jointly with the Annual Meeting of the American Philological Association at the Hotel Commodore, New York, N. Y., December 28-30, 1959.

The program of the meeting will be mailed to all members. Those who wish to read papers should submit titles and abstracts, not later than October 30, 1959, to the General Secretary, ARCHAEOLOGICAL INSTITUTE OF AMERICA, 5 Washington Square North, New York 3, N. Y.

Postscript to Haberland Report

In our last issue (ARCHAEOLOGY 12 [1959] 136-138) we presented an account of the investigations during the past year in El Salvador, Nicaragua and Costa Rica by Dr. Wolfgang Haberland of the Hamburg Museum for Ethnology and Prehistory. A recent letter from Dr. Haberland, written on board ship, homeward bound, rounds off his report. We quote from Dr. Haberland's letter:

On February 14 I flew from Costa Rica to Panama, and after some days went to the province of Chiriquí in the northwestern part of the country, where I spent nearly six weeks exploring and excavating. My special interest, the main objective this season, was to find additional sites of the Aguas Buenas culture, which I had first found during my last trip, and to secure more material from them. In this quest I was quite successful, locating and sampling six new habitation sites of this culture, which is, in my opinion, of the "Formative" developmental stage. Exploration showed that the Aguas Buenas culture covered quite a large area both in the highlands and in the coastal area of Chiriquí, with only minor variations between them. Furthermore, I excavated near La Concepción eight more graves of the "Classic" Chiriquí culture, more or less of the same type as those which I published in ARCHAEOLOGY (10 [1957] 258-263), but still richer in contents. In the area of La Concepción a new, possibly "Formative," complex was found, and farther east another complex, which seems to be contemporaneous with "Classic" Chiriquí. The material from both of these must be studied more thoroughly before it will be possible to define them exactly.

The next trip in Panama took me to the peninsula of Azuero (on the Pacific coast) where I dug test pits at some living sites near Guararé, which yielded a tremendous amount of sherd material, as well as bone and shell. No burials were encountered during the excavation. It will be interesting to compare this material with that ex-

cavated by Gordon R. Willey in the Parita region of the peninsula.

Originally I intended to do some more work in Panama, especially some linguistic research, but unfortunately there were at that time some revolutionary attempts, and all roads to Darién were closed. So I went, a little earlier than planned, to Colombia, where I spent the first five days in Bogotá, visiting the Museo Nacional to get more acquainted with the archaeological material of Colombia. This proved to be very instructive and interesting, the more so because many things have never been published. Then, upon invitation, I went for two weeks to Medellín, where I worked in the excellent museum and made a test dig at a nearby site. I was surprised by the wealth of objects in the Medellín museum and by the strangeness of its ceramic material, which reminded me of certain cultures outside Colombia. It seems quite worth excavating there and the whole trip gave me some new ideas on cultural development and/or migrations in this part of South America.

South Florida Society Formed

On April 19 the organizational meeting of the newest member society of the AIA took place in Miami, Florida. President Mylonas' lecture at that time provided a propitious inauguration for the South Florida Society, which started with thirty-six members. The President of the new group is Dr. Jerome D. Harold, the Vice-President is Dr. Richard Aldrich and the Secretary-Treasurer is Miss Ruth Lohman. Our greetings are extended to the newest AIA member.

SAA Meeting: 1959

The twenty-fourth annual meeting of the Society for American Archaeology was held at the University of Utah, Salt Lake City, from April 30th to May 2nd. Ninety-five papers were presented in ten sessions under the headings: Developments in Dating Techniques; General Papers on Archaeology; Historic Archaeology and Linguistics and Archaeology; Archaeological Theory and Method; Salvage Archaeology; Old World Prehistory Relevant to the New World; Arid Lands Problems; Archaeology of Central United States and Archaeology of South America; Archaeology of Mesoamerica and the Southwest; Archaeology of Western North America. The three days allowed for the meeting proved much too short a time for all that was said, and two and sometimes three sessions were run concurrently. This reporter found himself unable to attend the theoretical maximum of forty-five papers, and so the following brief summary can only suggest the tenor of the meetings.

New techniques of dating and new methods of analyzing archaeological, linguistic and ethnohistorical data are still being discovered. Perhaps the most recent tool from the physics laboratory is a technique called thermoluminescence. George C. Kennedy tells us that it is now possible to determine when an object was last fired or subjected to heat. Soon we may be having dates on when a pot was made or when lava last flowed down the sides of a mountain.

The old reliables, Carbon 14 and dendrochronology, are still going strong, but Bryant Bannister underscored the lack of trained personnel in tree-ring research. Many kinds of wood and woody shrubs are proving useful in tree-ring studies. Robert E. Bell showed that *Kauri* and *totara* can be used in New Zealand, while C. W. Ferguson indicated that even the big sagebrush *Artemisia tridentata* has possibilities in the Southwest.

Interest in Carbon 14 is as lively as ever, but Frederick Johnson emphasized that we must be cautious about sources of error. Even samples serving as laboratory standards may vary from their true dates. In order to minimize such errors, standard calculating samples have been prepared by the Heidelberg Laboratory and the National Bureau of Standards. When Carbon 14 dates are applied to the problem of extinction, Jim J. Hester finds that, counter to current beliefs, the late survival of the ground sloth is not indicated by radiocarbon dates. He also discovered that extinctions seem to have occurred earlier in the Great Basin and Coahuila, Mexico, than in adjacent areas.

Pollen analysis is being used more frequently for determining specific environmental situations. Pueblo Bonito appears to have had a fair degree of pine around the site when it was constructed and very little when it was abandoned. James Schoenwetter suggests that lumbering rather than climatic change may be the cause. Our conception of ecology in the High Plains may also be in for revision, for F. E. Green and Fred Wendorf presented pollen profiles for the last glaciation that had pine, spruce and fir instead of grass as some imagined.

Students of early man are still turning up new data and with it new interpretations. Joe Ben Wheat excavated 120 skeletons of *Bison occidentalis* that appeared to represent a single kill. Scottsbluff, Eden and Plainview or Milnesand points found in the bone bed point to their contemporaneity. In Grande Coulee, Washington, Douglas Osborne found two open sites containing micro-blades, polyhedral cores and (possibly) burins, associated with manos and metates. He explains it as a meeting and blending of Northern and Plateau-Basin traditions.

Mexico continues to be a constant source of vital information. On an early time level there is evidence from Tamaulipas that there was no single area or time when man began domesticating plants. Richard MacNeish showed that the evidence points to a multiple origin of New World crops at different time periods from 10,000 to 2,000 years ago.

The relationship between Mexico and the American Southwest is becoming increasingly apparent. J. Charles Kelley sees agricultural products and techniques diffusing from Mexico via a Desert Culture Base, with ceramics following later. The Chalchihuites culture of Durango appears to have influenced and modified the Hohokam enormously, and extended secondarily to the Anasazi. William W. Wasley points to an additional connection—a unique Hohokam platform mound dating between A.D. 1050 and 1150 that almost surely has a Mexican source. A striking interrelationship between the kiva and the ball court was demonstrated by Bertha Dutton on the evidence of shared architectural, religious and mythological traits.

Systematic investigations have finally begun in western Mexico. C. W. Meighan reported on a large Classic period site in Nayarit where he found a temple complex of stone stairways built upon an adobe brick foundation. Among the finds were bells, tweezers and plaques of copper that may be the earliest recorded from Mesoamerica.

Meighan suggests that the metal comes from Central America by coastal trade.

For the Highland Maya area an outline of the long architectural sequence at Chiapa de Corzo was given by Gareth Lowe, and the relationships of Chiapa de Corzo III ceramics both within and outside the Maya area was discussed by Bruce Warren. The recently discovered huge Miraflores stela from Kaminaljuyú was demonstrated by Heath Jones to have a Mayan hieroglyphic text (not Olmec or Zapotec), while Suzanne W. Miles noted that some of its design elements are connected to early stone sculpture from the Pacific slope.

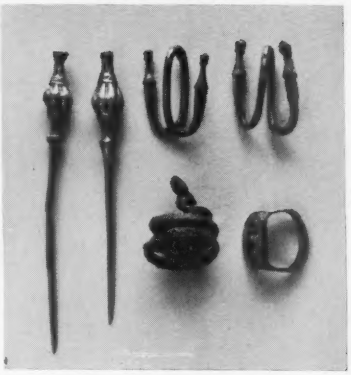
Speaking of an area farther south, in northeastern Honduras, Jeremiah F. Epstein showed that Mayoid influences extended well into eastern Honduras until the end of the Classic Maya period. After the Maya decline, the region was occupied by Chibchan-speaking people who appear to have originated in northern South America.

One of the most gratifying developments is seen in the tendency for archaeologists to branch out and utilize linguistic data. From several sources of information, Walter W. Taylor concludes that the Hokan-Coahuiltecan speakers had a Desert Culture and were possibly the first to enter much of Arid North America. The only linguist at the meeting, however, was A. Kimball Romney, who showed how various kinds of data may be useful to the prehistorian. In one example, the distribution of plants was compared with the names given to them by Hopi, Zuni and Navajo. When data are analyzed creatively, a surprisingly meaningful history of human migrations can be determined.

JEREMIAH F. EPSTEIN
University of Texas

Expedition to Tarrha

One of the least explored parts of the island of Crete is the south coast, particularly toward the west. Here the steep, inhospitable shoreline affords few sites for habitation and very little communication between them. During Classical times, however, from the fifth century B.C. through the Roman period, a number of small cities flourished here, owing partly to their position between Egypt and European ports. If battered by strong winds or attacked by pirates, ships on their way



Silver jewelry—dress pins, hair rings, finger rings—from grave of young woman at Tarrha. Fourth century B.C.

from or to Alexandria could find a haven. And the recent discovery of a sanctuary of Asklepios at Lissos shows that the apparent isolation of these south-coast towns was not so great as one would imagine.

In the spring of 1959 a brief trial excavation was conducted at another of these sites, one which has been identified (by the English traveler Pashley, in 1837) as ancient Tarrha. Now completely deserted except for a small settlement nearby called Agia Roumeli, it lies at the mouth of the nameless torrent that emerges from the spectacular gorge of Samaria. The expedition was conducted under the auspices of the American School of Classical Studies at Athens, with funds provided by the Corning Museum of Glass. Staff members were Gladys Davidson Weinberg, Saul S. Weinberg, Thomas S. Buechner, Director of the Corning Museum, and Mary H. Buechner.

The purpose of the expedition was to locate an ancient glass factory which may have existed somewhere along this part of the coast. A certain distinctive type of glass vessel (a pyxis) has been found only in this part of Crete and is consequently assumed to have been manufactured there. A large amount of glass fragments found on the surface at Tarrha, before excavation, led to the selection of this particular site. The hope of finding the glass factory was admittedly small because of the large area to be explored and the comparatively slight remains which might be expected from such a factory. A quantity of glass fragments was discovered, many of them burned and distorted by fire, but they do not seem to be waste from a factory. The amount of glass found was, however, unusually large, and it seems quite likely that a glass factory did indeed exist somewhere in the vicinity.

Although the campaign failed in its primary objective, the results proved interesting and valuable. An extensive cemetery of the fifth and fourth centuries B.C. yielded rare and beautiful silver jewelry as well as pottery (both Attic and local), a strigil, a lamp and coins. Roman tombs were also found, in one case with a tombstone re-used from an earlier burial.

Elsewhere were excavated substantial Roman buildings, entirely of stone, while other Roman structures are still standing above ground, preserved to the roof. The walls of Greek buildings, revealed at considerable depth, could not be thoroughly investigated because of the short time available. The formidable Roman fortifications are also very well preserved, and could easily be mapped.

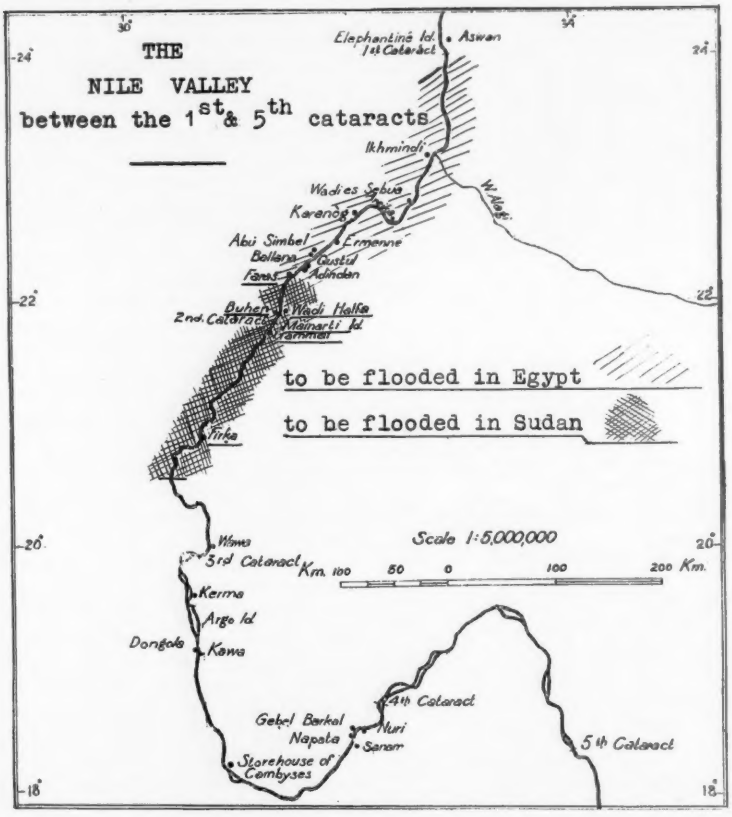
The investigation showed that the site was inhabited from at least the fifth century B.C. until the fourth or fifth century A.D. The city seems to have been abandoned because of the attacks of pirates and the decline of communication routes rather than conquest. After the fifth century the site remained uninhabited, and only rarely visited, until 1959.

Fragments of burned and twisted glass vessels found at Tarrha.

Sudan Archaeology Endangered—an S.O.S.

By Jean Vercoutter

Commissioner for Archaeology, Antiquities Service, the Republic of the Sudan



In 1896, when the building of the Aswan Dam was first considered by irrigation engineers, deep concern was felt in archaeological circles about the flooding of the wonderful site and temple of Philae. Eventually the outcry was such that instead of the projected high dam, only a small one was built. But the breathing space given to antiquity lovers was only a short one, and less than ten years after the completion of the original Aswan Dam the first heightening was considered, which was to flood an important part of Nubia south of the dam.

By that time (1906) the Egyptian Antiquities Service, led by the French archaeologist Maspero, was in full swing, and if the inundation of Nubia could not be avoided, it was at least possible to make a complete archaeological survey of the endangered area. This survey was entrusted by Maspero first to the American archaeologist G. A. Reisner, and then to the British Egyptologist C. M. Firth. From 1907 to 1912 a systematic survey of the Nile Valley, which is still a masterpiece of its type, was undertaken by these two scholars. Reisner and Firth themselves surveyed all the country on both banks of the Nile, combing the ground step by step from north to south and then again—to be sure that nothing was missed—from south to north. At the same time epigraphists and draughtsmen were at work copying all the inscriptions in the temples which were endangered by the raising of the water level. As a result of this thorough undertaking, Nubia between Aswan and Adindad is, archaeologically speaking, the best known part of the whole Nile Valley. This is even more true since a complementary survey, including the excavation of all the sites left unexcavated during the survey of 1907-1910, was undertaken by W. B. Emery, L. P. Kirwan and others from 1929 to 1938. Altogether over fifty volumes—mostly folios—have been devoted to the archaeology and monuments of this limited area.

Now history repeats itself, and there is deep concern on the part of archaeologists and others at the idea that Abu Simbel will be submerged if the projected new high dam at Aswan is built. The loss of the Abu Simbel temples would indeed be an irretrievable blow to Egyptologists and all nature lovers, but the fact is that the blow would be still more disastrous for the archaeology of the Sudan. Between Faras and a little south of Firka (area in heavy hatching on the map) we have, in recent years, recorded over one hundred archaeological sites which will be submerged beneath the waters of the projected reservoir. Among the sites and monuments which will disappear forever are the small Ramesside temple of Aksha, still buried in the desert sand; the lovely temple of Buhen with its fine carvings and paintings; the site of Semna with its two temples of the Eighteenth Dynasty; the sites, mostly Egyptian fortresses of the Middle Kingdom (2065-1500 B.C.), of Dabenarti, Mirgissa, Shelfak and Uronarti—to mention but the most important *known* monuments, not to speak of all the prehistoric rock pictures, rock inscriptions, and the Christian churches and paintings of the tenth-twelfth centuries at such sites as Abka, Aksha, Faras and Abd-el-Gadir.

What I should like to stress here is not only the prospective destruction of buildings of immense artistic value—an irreparable loss for the newborn Republic of the Sudan—but the fact that the part of the country which is going to disappear is practically unknown archaeologically. Professor W. B. Emery's excavations at Buhen (see *Illustrated London News,* June 21, 1958) show what can be found still buried in the desert. And Buhen was a site supposedly already excavated. What then can the unexcavated ones yield—that is, 92 percent of the reported sites, since but eight have been *partly* explored, and only *four* published! Each year when conducting our routine inspection and survey tours, we

Above: **Dabenarti** from the air.

Right: **Buhen Temple:** Thutmosis III in front of Falcon-god Horus.

Below: **Semna East Temple:** north wall.

Aksha Temple: list of southern countries.

Air photograph of Dabenarti from Sudan Antiquities Service Archives; other photographs courtesy Oriental Institute, University of Chicago.

find new sites and new inscriptions; cleaning or trial excavations reveal unexpected finds such as the paintings of the Djehuty-hetep tomb at Debeira or the Faras alabaster vase, which was found in a site thought to have been "excavated."

But the possible value of the objects still buried in this region of the Sudan is not the main worry of the Sudan Antiquities Service. What is still more important is that a significant part of the history of the Sudan, and of Africa as a whole, is at stake too. As I mentioned before, Lower Nubia—the country between Aswan and Faras—is the best known part of the Nile Valley, but what happened in Upper Nubia from prehistoric times to 2000 B.C., and then from 1200 B.C. to modern times is practically unknown, since this part of the Nile Valley is difficult of access and has never been properly excavated. Now, the Nile Valley is the obvious link between the Mediterranean world and Central Africa; it has always been so, and it is unfortunate that at the very time when Africa is beginning to take its place in the world, evidence of its past history should be destroyed. A survey of the endangered area, as complete as possible, must be undertaken before the waters are allowed to flood the country. The Sudan Antiquities Service would welcome aid from all countries and scientific bodies willing to offer their help.

A Woman of Phoenicia

This expressive little figurine representing a pregnant woman was found in a Phoenician cemetery at Akhziv, on the Israeli coast between Acre and Tyre. Here Mr. M. Prausnitz of the Israel Department of Antiquities has recently been clearing a number of tombs of the Israelite II period (eighth and seventh centuries B.C.) as well as of the Persian period (586 B.C. to Alexander the Great).

The figurine shown here, which dates from the Persian period, belongs to a type found all over the Phoenician cultural area, from Phoenicia itself to Carthage. In prehistoric and early historic times figurines of pregnant women represented fertility goddesses, while in later times they were considered to have magic protective powers in childbirth. The veil worn on the head and extending down over the shoulders is an Egyptian type of headdress often found on Phoenician monuments.

Chiapa I Affiliations

We have been asked by Mr. Bruce Warren, author of "New Discoveries in Chiapas, Southern Mexico," which appeared in our last issue, pages 98-105, to correct a statement on the ceramic affiliations of the Chiapa I phase. The last paragraph on page 101 should read as follows:

Chiapa I. The closest ceramic connections with Chiapa I outside the Central Depression of Chiapas were found by Michael Coe at the site of La Victoria on the Pacific Coast of Guatemala. The earliest phase (Ocos) at La Victoria, according to Coe, has some close connections with the Early Formative culture of Colombia and with the Chorrera Early Formative phase of Ecuador. In each case these ceramic phases are among the earliest found, yet they represent a widely distributed complex.

REVIEWS OF RECENT BOOKS

THE MESSAGE OF THE SCROLLS, by YIGAEL YADIN. 192 pages, 11 illustrations. Simon and Schuster, New York 1957 $3.95

The author of this readable little book is not only the son of E. L. Sukenik but also a competent archaeologist in his own right, and he has been working on the Dead Sea Scrolls (with some interruptions) since they were first discovered. His purpose in writing is threefold: "to present all the relevant facts relating to the Dead Sea Scrolls in a straightforward manner," to give a full account of the discovery and acquisition of the seven relatively complete scrolls brought to light in 1947, and to describe the scrolls and their contents. Of these three the last is said to be the most important, but for most readers the second will prove most interesting and enlightening.

The story of the acquisition of the seven scrolls for Israel in 1954 is related in detail. The author's remark that he had "some share" in this is a masterpiece of understatement. Some new light is shed also on the obscure transactions of 1947 by hitherto unpublished excerpts from Sukenik's diary. It is not surprising to find references to the establishment of the state of Israel mixed in with the account, all naturally told from an Israeli point of view. In the description of the individual scrolls the author's own contributions appear particularly in connection with the War Scroll and the Genesis Apocryphon.

Yadin's conclusions are cautious and reasonable. He is anxious to avoid "presentation of theory as fact." The scrolls were copied and hidden, he maintains, between 100 B.C. and A.D. 50, and the non-biblical documents were compiled within those limits. As to the identification of the Qumran sect with the Essenes he is non-committal: "decisive proof is lacking," though there are "facts which suggest a connection between the two and their possible identity."

For the record it may be noted that on pages 84 and 85 statements are attributed to this reviewer which were written by John C. Trever, and a statement on page 91 similarly attributed was written by William H. Brownlee.

MILLAR BURROWS

Yale University

MEETING PREHISTORIC MAN, by G. H. R. VON KOENIGSWALD. Translated from the German by MICHAEL BULLOCK. 216 pages, 48 figures, 24 pages of plates. Harper & Brothers, New York 1957 $3.50

MAN IN SEARCH OF HIS ANCESTORS. The Romance of Paleontology, by ANDRÉ SENET. Translated from the French by MALCOLM BARNES. x, 274 pages, 110 figures, 12 plates, 8 charts and tables. McGraw-Hill Book Co., New York 1956 $5.50

Each of these books is concerned with phylogeny, evolution and certain aspects of the history of evolution, palaeontology and archaeology. Each places particular emphasis on man. Each is simply and directly written, but there the resemblance ends, owing to differences in the authors' knowledge, experiences and intentions.

Meeting Prehistoric Man is autobiographical, by one of our foremost students of human palaeontology. The author takes us on his own search for prehistoric man—through the complexities of the rich Pleistocene fauna of Java, to China and Peking Man, all over the Far East while hunting in Chinese pharmacies for "dragon bones," then back to Java, and so to Africa and finally to Europe. He writes only about places he has seen and about specimens he has studied.

In contrast, *Man in Search of His Ancestors* covers the whole of the evolution of life, and is written by the editor of a scientific journal who presumably has not, himself, published research in palaeontology or archaeology. There have been many such books as this one, by good writers of good will but without deep understanding of their subject; in contrast, only *one* man could have written von Koenigswald's distillation of personal experiences. The two books overlap in content only where Senet's more general discussion impinges upon von Koenigswald's own work, and here, as would be expected, the latter has the ring of authenticity.

Senet employs the effective device of working from recent, prominently publicized situations into related realms presumably less familiar. Thus the exposure of the Piltdown fraud is used as a general introduction for the history of archaeology, and the story of the catching of a number of Coelacanth fishes precedes a discussion of "missing links" and the evolution of the vertebrates. The major topics are the history of archaeology, human

palaeontology, prehistoric life and art, phylogeny of the primates, evolution of the vertebrates, evolution of the invertebrates, the mechanism of evolution, and the origin of life. This may seem progress in reverse, with the true beginning at the end, but the story flows interestingly and the transitions between the subjects have logical bridges. The framework, thus, is admirable, but the facts packed into it are all too often erroneous. Senet's history and archaeology are quite good, although some of his statements are questionable. Concerning palaeontology, however, his misstatements of fact are multiple; chapters IV and VII, on human and mammalian evolution, respectively, are particularly poor. One outstanding example is the statement that the South African ape-men (Australopithecinae) existed throughout the Pliocene in the humid climate of the edge of the Kahalari desert (page 110). The climate was not humid, the Kalahari is farther west and, most important, the time was actually several million years later, in the Pleistocene.

Von Koenigswald is at his best when dealing with the human fossils of Java and China which he knows so well. There is a skilful weaving of present-day climate and culture, of palaeontological fact with history, of human anatomy and phylogeny. We can only wish that for many other subjects we had as enthralling a discussion of the personal side of a scientific field.

The emphasis throughout is on human evolution, with diverting excursions into psychic evolution, cave art and diffusion of ethnological traits. In only one matter of interpretation would I disagree with Prof. von Koenigswald—with regard to the supposed ability of *Meganthropus, Pithecanthropus* and the Neanderthals to speak. Perhaps they could, but there is no proof. The argument has been that possession of a motor speech center (Broca's area) on the third frontal cerebral convolution is proof of speech, since lesions here produce aphasia. But aphasia is not due only to lesions of Broca's area, nor can one argue directly from skull morphology, in an attempt at internal phrenology, as to the cyto-architecture of the adjacent part of the brain. It has been shown, indeed, that Broca had never even removed the meninges from the brains he claims to have studied, and that the speech centers actually are much more extensive than for the motor speech area alone. Nor is the *spina mentalis* (which is never cartilaginous, as claimed) a proof of speech. Speech depends upon complex neural mechanisms, and cannot be proved or disproved by minor osseous configurations. Furthermore, one cannot assume, as von Koenigswald does for Javanese species of *Pithecanthropus,* that the presence of a Broca's area necessitates the presence of mental spines, since neither character is a proof of speech, and thus they are not correlated. Actually, when a full jaw of a Javanese *Pithecanthropus* is discovered, it probably will be found to have mental spines, not only because these are present in *P. pekinensis,* but also because they seem to have evolved as an indirect result of man's erect posture, which has necessitated the elimination of the "simian shelf."

The two authors sometimes discuss the same subject in terms completely opposite. Thus, with regard to sabre-tooth tigers, Senet (in addition to thinking of them erroneously as derived from *Felis*) considers them only as predacious beasts; this is the older view, repeated in textbooks for generations. Von Koenigswald adopts the newer interpretation that these animals were carrion-eaters. Actually, the matter is not settled, and argument will doubtless long continue.

Von Koenigswald's book will be on the "must read" list of every student of human origins. Senet's book, in spite of brilliant organization and really excellent ideas on capturing and carrying the imagination of the uninitiated, cannot be recommended until after a thorough rewriting.

CHARLES A. REED
University of Illinois
Chicago

DE KUNST DER OUDHEID, by A. W. BYVANCK. Volume III. xii, 407 pages, 90 figures, 80 plates. E. J. Brill, Leiden 1957 28 guilders

This volume is part of a series meant to discuss the ancient art of the Near East and the Mediterranean. The first two volumes took the story down to the end of the Archaic period; the present one discusses Greek art of ca. 480-300 B.C. Although the language barrier will prevent a wider use of Byvanck's work in this country, it deserves notice on two counts.

In the first place, the scope of this enterprise is eminently useful to students. Few authors have the courage to produce general discussions of the various aspects of ancient art (architecture, sculpture, painting, minor arts) in handbook form with enough illustrations and footnotes to provide general orientation to the non-specialist or the beginner. The reader of English is poorly equipped in this respect, although the series of Pelican volumes on history of art begins to fill the gap.

The second reason for drawing attention to this volume is diametrically opposed to the first: the sketch of Greek art in this volume is not, in detail, the reflection of generally accepted and established opinion. Byvanck has studied chronological problems with great personal interest, paying special attention to the interrelations of styles of vase-painting and sculpture. As a result he has developed a frequently heterodox system of dating Greek works of art. His opinions and arguments deserve the specialist's attention. Footnotes refer to the documentation in chronological matters; but should not the general reader be told in the text that controversy exists, e.g., with regard to the Niobid krater and the New York kraters with Amazonomachies, here dated respectively post 440 B.C. (page 180) and ca. 425 B.C. (page 190), as against much higher current estimates?

As a final observation, any reader, whether beginner or critical colleague, will lose patience at times trying to locate the figures referred to in the text. The system followed here—plates interleaved in the text—is never efficient for reference purposes. If a separate plate volume is considered extravagant, the Pelican system of plates grouped in the back is vastly preferable for the reader and equally agreeable to the browser.

MACHTELD J. MELLINK
Bryn Mawr College

STONEHENGE, by R. J. C. ATKINSON. xv, 210 pages, 8 figures, 25 plates. The Macmillan Company, New York 1957 $3.50

Few monuments from the past, perhaps only the pyramids, have been the subject of more general interest (and

misinformation) than Stonehenge. It is very useful to have in this rather brief book an excellent presentation of the important facts and a careful but imaginative appraisal of the monument's significance. Atkinson's book is a model of what archaeological writing should be, and it can be unreservedly recommended. The author begins with a factual account of the stones themselves, their arrangement, and the associated ditches and other features; he next presents evidence for the relative and absolute age of the successive forms of the monument; and he then discusses the probable sources of the stones and the methods by which they were transported and set up. After a short survey of the several culture periods during which Stonehenge was built and used, the book closes with the important problem of why it was built, and with an enjoyable review of its role during three centuries of changing viewpoints in British archaeology.

Stonehenge began, not much before 1700 B.C., with an encircling ditch and presumed central timber structure, and a century or two later the "bluestones," weighing up to four tons each, were brought some 150 miles from Wales and set in their initial positions. The subsequent transport of the "sarsen stones" from at least twenty miles away, and their shaping and erection, were even more impressive engineering feats, since some of them weigh as much as fifty tons. Atkinson considers carefully the problems and implications of these accomplishments, including the logistic and social factors involved.

Above five years ago it was discovered that several stones had shallow but unmistakable carvings representing daggers and axeheads. Unnoticed, or at least unreported, for nearly 3500 years, they supplement the evidence supplied by the architectural sophistication (such as the use of entasis) of the larger stones, and suggest a close and direct relationship with Mycenae at the time of the Shaft Graves. There could hardly be more dramatic evidence of the unity of the ancient Mediterranean and Western European world and of the vigor of its commercial and military explorations.

Recent additional work at Stonehenge, including re-erection of several fallen stones, will doubtless add new details to the already fascinating story of this site. It is gratifying that Atkinson is taking part in this work; we will look forward to further careful descriptions and thoughtful interpretations from his hand.

RICHARD B. WOODBURY
Columbia University

GOLGOTHA AND THE CHURCH OF THE HOLY SEPULCHRE, by ANDRÉ PARROT. Translated by EDWIN HUDSON. 127 pages, 29 figures, 11 plates. Philosophical Library, New York 1957 (Studies in Biblical Archaeology, No. 6) $2.75

This attractive little book is a good translation of an interesting work by one of the best contemporary archaeologists in the biblical field. The title would lead one to expect a full treatment of the architecture, but this is not, in fact, a feature of the volume. Its special concern is with the tomb of the Savior and various other tombs in and near Jerusalem which have been connected, rightly or wrongly, with biblical characters. The author gives a lucid, well documented account of the topographical and other reasons which indicate the traditional holy sites as

authentic, though he does not bring out the fact that the Calvary has a much better claim than the tomb itself. Quite rightly, he is severe on the "Garden" or "Gordon" tomb. Something like a dozen ancient tombs of varying types are discussed, and this makes it possible to envision the tomb of the Savior with its proper setting in architectural history.

Like many others from the Occident, M. Parrot is affronted by the Church of the Holy Sepulchre in its present condition, and he gives very little material on it. He accepts the monumental work of Vincent and Abel (*Jérusalem,* II [1914]) as being the last word on the architecture of the Church of the Holy Sepulchre, and evidently feels that their rather arbitrary diagrams suitably represent the lost ancient buildings. Certain cautious students, fearing to fall into the errors of old-fashioned romantic restorations, avoid all restorations but the simplest.

This reviewer believes that much more than a diagram is possible in the case of the Church of the Holy Sepulchre. The same desire to know and to tell about the holy sites which has prompted M. Parrot's own publication has brought into being, through the centuries, a considerable body of pictures, description and commentary, beginning with a famous pilgrim account of 333 (two years before the first church on the site was dedicated). For my conscientious attempt to make pictorial restorations on the basis of this material, one may consult *Speculum* 31 (1956) 1, or the *Proceedings of the American Philosophical Society* 102 No. 1 (1958) 14. I am glad to acknowledge that these studies owe a debt to M. Parrot's French text of 1955, as well as to Vincent and Abel.

KENNETH JOHN CONANT
Harvard University

CATALOGO DELLE SCULTURE DI CIRENE: Statue e Rilievi di Carattere Religioso, by ENRICO PARIBENI. x, 168 pages, 483 figures on 209 plates. "L'ERMA" di Bretschneider, Rome 1959 (Monografie di Archeologia Libica, no. 5) 18,000 lire

This splendid publication is far removed from the character of a "mere" catalogue, in its origin, in the nature of the material treated, and in the method of presentation. It is one of a series of volumes which are to be devoted to the description of the works of ancient art discovered at Cyrene. The sculptures included are limited to those with a religious significance. (Other classes are to be treated by other specialists.) These works of art range in date from ca. 570 B.C. to ca. 50 B.C. During certain periods the items consist largely of works produced at the chief artistic centers of the Greek world (in early times, Samos and the Cyclades, with use of island marbles; rarely Spartan or Peloponnesian in general; in the Classical age, Athens, where Pentelic marble is used), or else executed at Cyrene itself either by immigrant artists or by local craftsmen under the influence of these homeland schools. At other times the demand for sculpture was predominantly met by local artists who developed a distinct style of their own.

Dr. Paribeni's acknowledged eminence as an interpreter of ancient sculpture will attract special attention to his appraisal of this unique material —an interpretation which includes the informative photographs which he himself has taken. In a few instances, it was necessary to use old photographs which show the statues in a

less fragmentary or damaged condition; and in an appendix some items now entirely lost are shown by means of old photographs.

The catalogue naturally includes a considerable number of items which have already made their appearance in a somewhat scattered periodical literature: these now receive a setting in a broad and coherent context, benefiting greatly by the new photographs and the fresh appraisal. But the volume's more immediate appeal rests on its quantity of entirely unpublished material. This publication will prove indispensable both to students of Greek sculpture and to historians of Cyrene, an outlying Greek community which has only recently begun to assume its rightful place in the picture of the ancient world.

A. W. VAN BUREN
American Academy at Rome

MAN, MORALS AND HISTORY, by CHESTER C. MCCOWN. xvii, 350 pages, 15 illustrations, 2 maps. Harper & Brothers, New York 1958 $5.00

At the time of the author's death at the age of eighty-one in January, 1958, he was engaged in making final revisions of his book. The task was completed by John H. Otwell and Mrs. Beatrice McCown Mattison. McCown was one of the leading biblical scholars of his generation, a lucid writer and a highly competent archaeologist. Consequently this important and fascinating volume, while not primarily in the field of archaeology, takes into consideration the vast amount of archaeological data that explorers, excavators and epigraphers have brought to light, particularly in the Middle East.

Much of the study is focused on Palestine, which has been a center of human development since Paleolithic man and the object of more intensive study than any other similar area. But the study of Palestine necessarily must include consideration of the surrounding lands, which throughout history have influenced the development of human thought. Using the figure of the Grail, McCown has taken Palestine as the inner cup and the contiguous countries as the outer cup. Babylonia, Egypt and Persia contributed their share in producing the people which emerged as the Hebrews, who in some measure were the same as the *Khabiru* or *'Apiru*. It is considered plausible that an important part of the nation was for some generations in Lower Egypt, possibly at the time of Akh-en-aton, and brought out a protomonotheism. But if Moses was a monotheist it made little difference to the people. Amos was the first whose utterances suggest a real monotheism, and not until the time of the Gospels is there evidence that the majority of the Jewish people as a whole accepted monotheism.

Immortality and resurrection are considered to be largely outside of Hebrew thinking before contacts with Mazdaism and Hellenism. The dead simply went to Sheol. Apparently the elaborate Egyptian beliefs in life after death made no impact on the thinking of the Israelites. The idea of the conflict between light and darkness, as portrayed in the Qumran documents and the Gospel of John, is considered as coming from Mazdaism. Responsibility for looking after the poor, as represented by the widow and fatherless, was a common theme in the Middle East, found in some of the oldest Sumerian, Akkadian and Egyptian texts.

The Hebrew prophets are said to

represent a high point in theological and ethical development. They believed that God worked through human agency; Jesus thought that the end was at hand. McCown locked horns with the orthodox, the neo-orthodox, the millennialists and those who attempt to make a consistent biblical theology, hence many who read the book will find some of their cherished concepts challenged. A principal thesis is that there has been progress in human history and that, though perfection is unattainable, there is reason for hope in the future.

For the archaeologist a valuable feature is four chronological tables from four million B.C. to the second century A.D.

O. R. SELLERS
McCormick Theological Seminary

POMPEII: THE CASA DEI DIOSCURI AND ITS PAINTERS, by L. RICHARDSON, JR. xix, 165 pages, 58 plates in portfolio. American Academy in Rome, Rome 1955 (Memoirs of the American Academy in Rome, Vol. 23)

The reader of an extensive monograph on a single, still extant house in Pompeii is justified in expecting to be provided with an accurate plan, full photographic documentation of its paintings and a complete bibliography. These elementary requirements are not fulfilled in this volume.

The first two-thirds of the book is devoted to a detailed description of the house: its construction, its individual rooms, its building history, its ownership. The text must be followed with the aid of a schematic nineteenth-century plan lacking indication of windows or blocked-up doorways; dadoes, predellas, naval battles, rare graffito undersketches, friezes and landscapes are unillustrated even when characterized as "unique in Pompeii"; old drawings and water colors of lost paintings have not been reproduced nor new drawings prepared to suggest the appearance of the remarkable peristyle (which is construed to defy photography); and figure paintings in Naples are similarly omitted—these oversights constitute almost insuperable obstacles to a critical reading of this section, even if the reader is prepared to forego a history of the excavation of the house or any attempt whatever to consider the very existence of an iconographic program in a single one of its richly decorated rooms.

In the last third of the book, Mr. Richardson sets out to establish the authorship of a selection of figure paintings from the Casa dei Dioscuri and, on the basis of his attributions, to assign to the seven masters whom he considers responsible for execution of these paintings a host of additional works in Pompeii, Herculaneum and Stabiae. (He does not, as the title implies, consider all the paintings from the house nor does he include still lifes, landscapes or "decorative framework.") After disposing of those of his predecessors in the attribution of Roman paintings to individual masters whom he elects to mention, the author reveals himself an adherent of the doctrine that all Pompeian paintings are copies, hence lacking in compositional originality. But if composition was eliminated as an index of personal style, was it also necessary to disregard such tell-tale idiosyncrasies as the rendering of inanimate objects or of foliage? By seizing upon the drawing of a single head in a complex painting, by comparing hands, limbs, the drawing but never the function of drapery, by constantly mistaking similarity of position for identity of style, the author emerges with masters like his Io and Iphigeneia Painters whose *oeuvres* embrace an inconceivable diversity of pictorial approaches. His practice of comparing unillustrated paintings or details with other unillustrated features precludes the possibility of accepting or rejecting a large proportion of his attributions. But so far as they exist, the illustrations, especially Felbermeyer's details, are excellent, allowing the reader to supplement the author's equivocal characterizations (the same painting can be "great" and a "frigid schoolpiece") by objective comparisons. They imply that Mr. Richardson's Theatre and Perseus Painters may be convincingly encountered outside the Casa dei Dioscuri but that their colleagues have eluded him.

PHYLLIS WILLIAMS LEHMANN
Smith College

THE SCYTHIANS, by TAMARA TALBOT RICE. 255 pages, 70 figures, 62 plates. Frederick A. Praeger, New York 1957 (Ancient Peoples and Places, edited by Glyn Daniel) $5.00

Mrs. Tamara Rice writes about the Scythians in a lucid, occasionally romantic, style. Moved by the vast scope of Scythian history and the splendor of their remains, she has patiently assembled a detailed picture of their customs and of the texture and rhythm of their experiences.

The book deals with every conceivable aspect of Scythian studies: anthropometry, linguistics, religion, archaeology, art history, dynastic history, costumes, nomadism, climatology, warfare, economics, social organization, etc. The discussion ranges in time between the Scythian graves of the seventh century B.C. and the extinction of the Scyths by the Sarmatians and Goths; in space it ranges from the graves of Vettersfeld in Prussia to those of the Altai, with excursions into Scythian "legacies" to the Chinese and the Sarmatians, Goths and Vikings.

Mrs. Rice has incorporated into her book the fruits of recent Russian excavation and research. She presents a general discussion of the Pazyryk discoveries, integrating them with the more familiar Scythian relics. Beyond this, she alludes to evocative material taken largely from A. L. Mongait's *Arkheologia v SSSR* (Moscow, 1955): prehistoric hunting scenes from Uzbekistan, likened to Palaeolithic murals of Altamira and Font-de-Gaume; life-sized animals carved in bone or wood as hunting decoys at Neolithic sites in Siberia; Scythian princely burials in Soviet Armenia revealing objects of Hittite origin; evidence of second millennium bronze industry in the Caucasus besides that of the Maikop tombs.

Technically, *The Scythians* has a mixed pattern of merits and flaws. The work is well buttressed by maps and chronological charts, an index, and lists of major Scythian burials and known kings. And there are clear reproductions of new photographs of familiar objects, largely in the Hermitage Museum. But the bibliography is quite faulty: numerous entries are incomplete and names are misspelled. Within the art historical aspects of the work, numerous problems crop up. Thus, in a generally clear account of ancient Near Eastern influences upon the formation of Scythian art, there is a reference to Achaemenian art of the eighth and seventh centuries B.C. (page 107); an engraved image of the Scythian "Great Goddess" holding two lions (Kelermes, seventh-sixth century B.C.) is said to be derived from

the Gilgamesh motif "of the Sumerian age" (page 151). And one may cavil with the failure to refer the reader to anything more substantial on the Ziwiye (Sakiz) Treasure than Ghirshman's popular Penguin book on Iran or to illustrate any of its objects when it is discussed at length as one of the oldest sources of Scythian art.

The book is authoritative in its reconstruction of the tenor and mechanics of Scythian life, nomadic or settled. It is presented with clarity and an emotional warmth appropriate to the subject. In any of the more specialized areas of study, it must be used with great caution.

JOHN M. ROSENFELD
University of California
Los Angeles

ANCIENT MAN IN NORTH AMERICA, by H. M. WORMINGTON. xviii, 322 pages, 72 figures, map. Denver Museum of Natural History, Denver 1957 (Denver Museum of Natural History Popular Series, No. 4) $3.65 (paper bound); $5.25 (cloth bound)

The most recent edition of this invaluable book, first published in 1939, reflects the snowballing of information regarding early inhabitants of the New World, for the first edition covered the subject in eighty pages.

The author first discusses briefly some aspects of Pleistocene geology. Next she outlines dating in terms of geological setting, stratigraphy, and the more recent development, radiocarbon measurement.

Her section on stone industries covers significant finds of artifacts attributable to early occupants of the continent, embracing not only fluted points of what she terms the Paleoeastern Tradition, but the less well known material of the Paleowestern Tradition, as well as the Paleonorthern Tradition. A few finds which do not belong clearly in any of these categories are also mentioned. The author also refers to certain locations at which there may have been contact between early hunters and people of the Archaic stage.

The section devoted to human skeletal remains is a factual account of finds of human remains which may validly be assigned some antiquity.

The chapter on the peopling of North America reviews hypotheses regarding the early coming of man to the New World. Because there is not sufficient information, the author cannot be definite in this respect, and this may be annoying to some who look for a quick answer. The fact is that we are in no position to do more than make "scientific guesses" about the discovery and exploitation of the New World by primitive man.

If one would point out any shortcomings in the book he would be hard put to it. Perhaps one would wish that the discussion were in terms of Ancient Man himself rather than his implements. Data have accumulated to the point where it is possible to make an "educated guess" regarding the life which these people must have led. To this reviewer it is regrettable that the author did not devote more attention to the inventories of tools associated with the points which she so ably discusses. Striking similarities may be noted between tools found at the Lindenmeier site, in Colorado, and tools found at paleo-Indian sites in eastern states; this has considerable bearing on interpreting the status of the eastern sites. It is possible to account for the similarities in one of two ways: either extreme conservatism al-

lowed little change in work habits over a very long time, or eastern paleo-Indians and hunters on the High Plains were more nearly contemporary than some people have been willing to admit.

Such comments are minor criticisms of an invaluable book which will be extremely useful to professional and layman as well. The author is to be congratulated on her outstanding contribution to the literature on early man in North America.

DOUGLAS S. BYERS
R. S. Peabody Foundation
Andover, Massachusetts

THE ANVIL OF CIVILIZATION. An Archaeological History of the Earliest Egyptians, Hittites, Sumerians, Assyrians, Babylonians, Greeks and Jews, by LEONARD COTTRELL. 256 pages, several figures, 22 plates, 6 maps. New American Library, New York 1957 $0.50

Today when one can fly in less than two days from any part of America to the lands where modern civilization was born, there is a need for a short, inexpensive guide to the history of these lands. This pocketbook has much to commend it. The author is neither an archaeologist nor a professional historian. He is a traveler who has satisfied his curiosity by intelligent observation, by talking with archaeologists, and by reading the books of the historians of the several cultures of Classical and Near Eastern lands. He has constructed a chronological sequence of events in each of the eight major areas—Egypt, Mesopotamia, Phoenicia, Crete, Asia Minor, Greece, Persia, and Syria-Palestine—and has related what happened in one area to events in the other parts of the anvil on which civilization was hammered out. Extremely useful is the chart which lists by centuries from 3000 to 400 B.C. the major events and personalities in each of the major areas of the ancient world. Although it contains some mistakes and discrepancies—Sheshonk is placed 300 years too late, Hammurabi is dated 300 years earlier than in the text, and the writings from Ugarit are placed ten centuries too early—it is nevertheless a useful device for getting a perspective of ancient history. The book is personal, in that the author has admittedly chosen those items of history which appeal to him. Such a selection provides an oppor-

tunity for the author to reveal his own enthusiasms and relieves successfully what otherwise might be a monotonous recital. As a first book for the traveler to the Near East and Greece this is well worth its weight—less than 7 ozs.—even with restricted baggage allowance for air travel. It belongs definitely to the first course of *hors d'oeuvres*. With this appetizer the reader can proceed to a more satisfying meal suggested by the bibliography which appears at the end.

JAMES B. PRITCHARD
Church Divinity School of the Pacific

THE LOW COUNTRIES, by S. J. DE LAET. 240 pages, 34 figures, 63 plates. Frederick A. Praeger, New York 1958 (Ancient Peoples and Places, edited by Glyn Daniel) $5.00

Like Brea's recent volume on Sicily, Professor De Laet's book is another welcome addition to the *Ancient Peoples and Places* series. To the reviewer's knowledge, this is the first comprehensive treatment of prehistory in the Low Countries. The material on the Netherlands is particularly valuable for English-speaking archaeologists, since so few of us have even a passing acquaintance with the Dutch language.

With the exception of a few small regions, the Low Countries did not comprise a very favorable habitat for prehistoric occupants. Yet at the same time the area was a natural crossroads for cultures of northwestern, southwestern and central Europe. From Palaeolithic times onward the Low Countries were not culturally homogeneous, for one finds marked distinctions between the regions north and south of the Rhine (or, roughly speaking, between Holland and Belgium).

Because of glacial and periglacial conditions, the Lower Palaeolithic is poorly represented until Levalloisian-Mousterian times. Among the fossil finds of this period is the Spy Neanderthal man of Belgium. During the Upper Palaeolithic, Holland was a part of the Hamburgian reindeer-hunting complex of northwestern Germany, while Belgium was occupied by Aurignacians and Magdalenians of French origin. Likewise, during the Mesolithic, Holland was tied in with the Ahrensburg-Maglemose-Ertebølle area of the Baltic, and Belgium with the Tardenoisian of France.

The earliest farmers were German Danubians (Omalians) who occupied only the loess regions of Dutch Limburg and Belgian Hesbaye. After they disappeared, northern "Funnel Beaker" people entered Holland, and Belgium was occupied by Michelsberg herders and flint-miners. Still later, a mixed culture of Cordware (Battle-axe) and Bell Beaker people moved into Holland (and some of them across the channel to Britain). In Belgium, there are a few signs of the French Late Neolithic Seine-Oise-Marne (SOM) culture.

Compared with surrounding areas, the Bronze Age of the Low Countries appears rather poverty-stricken—at least partly because there was no copper, tin, gold or amber for trade. As in Scandinavia, stone implements were made for a long time in imitation of bronze ones. Strong ties, which had been established even before the Beaker period, were maintained with the British Isles. The Late Bronze Age Urnfield people apparently entered Holland from central Germany, and Belgium from southern Germany and

northern Switzerland. De Laet suggests this may represent the first visible delineation of the Germans and Celts.

By about 650 B.C., Iron Age Hallstatt warriors had reached the Low Countries south of the Rhine. North of the Rhine, Late Bronze Age traditions merged gradually into those of the La Tène culture (Late Iron Age). The powerful warrior-aristocracy of the La Tène Celts seemingly had little effect on events in the Low Countries, and for this reason their downfall in the third century B.C. is likewise scarcely reflected.

The excellent plates in the back of the book are referred to by number in the relevant margins, making it easy for the reader to tie the text and illustrations together.

W. CREIGHTON GABEL
Northwestern University

BRIEF NOTICES

THE KENSINGTON STONE, a Mystery Solved, by ERIK WAHLGREN. xiii, 228 pages, 29 figures, 1 map. University of Wisconsin Press, Madison 1958 $5.00

This is a remarkable volume which combines outstanding scholarship on the engraved characters of the Kensington Stone and their interpretation with excellent judgment and fairness in the assessment of the history connected with its "discovery" and later promotion. The Kensington Stone and its supposed connection with ancient Vikings has had much too long a life as a subject of serious study; even this book will not be able to eradicate the damage done by the wilful and careless perpetrator of an obvious hoax. It may be suggested that this book be required reading for the officers of the Smithsonian Institution and the National Geographic Society. There is no archaeological evidence for pre-Columbian Norse contacts along the east coast, although there is reasonable justification for the belief that they did land there—somewhere. At least the Kensington Stone has not been the center of a new religious cult.

MIXTEC ETHNOHISTORY. A Method of Analysis of the Codical Art, by PHILIP DARK. 61 pages, 5 figures, 2 tables. Oxford University Press, London 1958 $4.80

Most of the extant highland Mexican pre-Conquest codices are Mixtec rather than Aztec; some are presumed to be genealogical and historical, some calendrical and astronomical, but opinions as to their content differ. This essay is concerned with two codices of the genealogical-historical group, the Bodley and the Selden. Dark reduces the phenomena to symbols and analyzes them by two new systems that he calls the Ideographic-Iconographic and the Aspect Sheet. The result is a better knowledge of the patterning of the Mixtec codices, with tentative genealogies, and suggestions for the similar analysis of other codices. The study will help to place these genealogies in their proper chronological position.

THE EXPLORATION OF TIME, by R. N. C. BOWEN. viii, 143 pages, 40 figures. Philosophical Library, New York 1958 $6.00

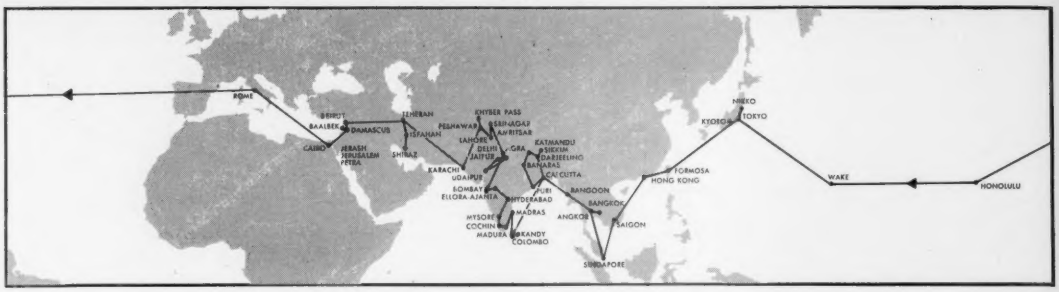
This is a brief presentation of a variety of techniques to measure past time. The striking contributions from astronomy, chemistry, physics, botany and other sciences in the determination of the age of the earth, its past life and past cultures are here reviewed. As an introductory survey with useful figures it has considerable value. It is probably overpriced.

EXCAVATIONS AT CLAUSENTUM SOUTHAMPTON 1951-1954, by M. AYLWIN COTTON and P. W. GATHERCOLE. x, 169 pages, frontispiece, 37 figures, 6 plates. Ministry of Works, Her Majesty's Stationery Office, London 1958 (Ministry of Works, Archaeological Reports, No. 2) £2.5s

This is a careful report of excavations at Bitterne (ancient Clausentum) on the River Itchen, three miles above its junction with Southampton Water. Earlier diggings by Waterman (1937-1939) and Muller (1946) are summarized. The amount of material, as is to be expected, is not large, but the report is meticulous and competent. The discussion of pottery types is especially good.

CATALOGUE OF THE UGO SISSA COLLECTION of Stamp and Cylinder Seals of Mesopotamia, by E. DOUGLAS VAN BUREN with List of Recent Acquisitions by UGO SISSA. 37 pages, 292 illustrations on 18 plates. Dr. Ugo Sissa, Via Ripetta 252, Rome 1959

The significance of this class of minute objects for art, religion and the history of culture is becoming increasingly recognized. The collection here published is not large but has the unusual merit of containing specimens of the glyptic art of every period from the Jamdat Nasr Age down to the [illegible]an period. The descriptive catalogue includes 139 items; numbers 140 to 292 are listed among the recent accessions. Each item is reproduced photographically from impressions of the seals, many of them slightly enlarged to show details more clearly.



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